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THE process of obtaining solid ingots and doing away with the piping and central segregation that has been the bane of the steel maker for so many years, which is described in another column, is certainly a simple method of getting rid of a great trouble. The position of the metallurgist who suggests the scheme is such as to place the facts on a basis that admits of no doubt. The only point to be determined is whether this process and its redistribution of the impurities of the steel does not introduce some other factor that will have a detrimental effect on the strength and wearing qualities of the steel. As to this, actual service alone can determine. The process certainly appears to be based on sound principles and when it can be subjected to the scrutiny of the prominent metallurgists and railmen of the country, as it was recently, without receiving adverse criticism—the entire discussion limiting itself to questions regarding the process, and the effects of certain conditions—it is giving a promising outlook.

A PAPER on "The Locomotive Superheater and Some of Its Effects on the Cost of Railway Operation" was presented by Gilbert E. Ryder before the November meeting of the New York Railroad Club. There seemed to be no question on the part of the railroad men who took part in the discussion, but that the superheater was a most desirable adjunct to the locomotive, although the amount of fuel economy that is claimed for it was questioned by some. As Mr. Chambers of the Central of New Jersey said, the effect of the superheater on the efficiency of operation is a most important advantage, even if the question of fuel economy is left entirely out of consideration. The discussion centered largely on the problem of lubrication. Mr. Wilden of the New Haven said that he had found the high degree superheater oil far more satisfactory than the oil which is ordinarily used on the saturated steam engines. It costs considerably more per gallon, but it is not necessary to use as much of it and in the end it is cheaper for use on superheater engines than the common oil. He had found it necessary, however, to have an automatic device for injecting saturated steam into the cylinders whenever the throttle is closed and the engine is allowed to drift. The fact was developed that the Lackawanna has been using a graphite lubricator on some of its superheater locomotives for several months with good results. A representative of the Galena Signal Oil Company said that experiments were being made in Canada, which, it was expected, would make possible the use of ordinary lubricating oil on the superheater engines. The experiments, however, were not sufficiently far advanced to enable him to make a positive statement to this effect. The high degree superheater oil is said to be more susceptible to changes in temperature and does not feed as regularly as the common oil. It is, therefore, necessary for the enginemen to watch it more closely to make sure that it feeds regularly. Representatives of the railroads, who were closely in touch with the operation of superheater locomotives, claimed, however, that they had heard no complaint or criticism from the enginemen in this respect.

AFTER all of the hysterical utterances about scientific management and the vast amount of material that has been published concerning it, and the principles underlying it, the report of the sub-committee on administration of the American Society of Mechanical Engineers on the Present State of the Art of Industrial Management is of more than ordinary interest. This report, carefully compiled by men of eminence in the engineering and industrial world, is far more moderate in its statement of the principles, and as to the possibilities of rapid returns from scientific management, than have been its enthusiastic advocates. Another interesting and significant fact in connection with the report is that the only railroad member on the committee, H. H. Vaughan, assistant to the vice-president of the Canadian Pacific, could not agree with the report as it was drawn up, and presented a minority report. Mr. Vaughan is recognized as one of the most far sighted and efficient motive power department officers on the continent, and it is well known that he has given considerable attention to the theories expounded by the different schools of so called efficiency engineers. Moreover, he has had on his staff of advisers an industrial engineer of no mean reputation, so that, viewed from the standpoint of the efficiency engineer, the motive power department of the Canadian Pacific may be considered as having introduced the principles of scientific management to a greater extent than any other road on the continent, with the possible exception of the Santa Fe. Mr. Vaughan's report is also, therefore, of special interest.

THE interesting and important work which the Railway Signal Association has laid out for itself is outlined on another page. A novel assignment is that having to do with the specifications in the Association's manual in which the railways of the northwest have particular conditions and requirements peculiar to their own territory. The Northwestern roads have the difficulties of mountain weather, long distances between stations and scarcity of good signalmen, so that the question, automatic vs. non-automatic, is sometimes puzzling. The instructions of the Board of Direction for committee work during the coming year are of special interest in other respects. Committee No. 1 is to take up the economics of labor in signal maintenance, which will undoubtedly include an investigation of the proposed combination of track and signal maintenance. The Railway Engineering Association also has begun an investigation of this subject. Signal engineers have, it would seem, let themselves be put on the defensive in this matter to such an extent as has almost committed them as unfavorable to the combination of the maintenance work connected with signaling with that of other facilities. A thorough study of the subject, and a perfectly fair and unprejudiced report ought to go far toward putting them on the basis where they belong, and where they undoubtedly wish to be understood as standing, namely, that if there is economy, the combined maintenance should be adopted, and if there is not it should not be. Other committees have received instructions to investigate and prepare specifications for the use in signal work of various standard electrical appliances. Magnet wire, wire ducts, terminal boxes and manholes are some of the devices for which specifications will be formulated. Committee No. 2 will take up the matter of specifications for electro-mechanical interlocking, which is the latest development of apparatus of this kind. The committee on contracts, following a suggestion made at the March meeting, is to prepare a standard form of agreement covering the supply of electrical energy for signal installations as from municipal lighting stations. The special committee on storage batteries is now a standing committee, No. X, and the investigation of the comparative economy of the various methods of charging storage batteries has been added to its work for the coming year. The instructions on the whole indicate a lively appreciation of the tendencies of up-to-date construction and the necessities of advanced practice; and the character of the names in the list gives assurance of thorough and valuable work.

EDGAR E. CLARK'S term as a member of the Interstate Commerce Commission will expire on December 31. It appears to be the consensus of opinion among those who are most interested in the work of the commission, both railway men and shippers, that he should be reappointed. In this view the *Railway Age Gazette* heartily concurs. During his six years of service on the commission, which coincide almost exactly with the period of its greatest development and activity, he has come to be regarded as one of its ablest members. His integrity and intention to be fair have been recognized by all who have come in contact with him or observed his work. Originally appointed by President Roosevelt in 1906 to give railway labor representation on the commission, there has been no evidence that the fact that he was formerly a labor leader has influenced his work unless to season it with a practical experience and knowledge of railway conditions. Mr. Clark has been in charge of the difficult and complicated task of effecting uniformity in the compilation and publication of railway tariffs. His labors along this line have been criticized; but on the whole they have been beneficial; and criticism of a commissioner may not mean any more than that his duties are such that no one could so perform them as always to escape even just criticism. Mr. Clark has been among those who have traveled most extensively about the country in the conduct of hearings, and has several times been selected to arbitrate complicated controversies involving rates and wages. In his work his keen sense of justice and his desire to be impartial and to effect practical and sensible settlements have commanded respect. He bears the reputation of having been one of the hardest workers and most diligent students of railway affairs on the commission. We believe there has been no suggestion of apprehension that he would not be reappointed. It has now come to be accepted pretty much as a matter of course that the members of the commission shall be continued in office—a most salutary policy. It would be most unfortunate to replace a commissioner who has had Mr. Clark's experience with a new man, even though of high qualifications in other respects. In the case of a body endowed with such enormous powers and charged with such manifold duties as the Interstate Commerce Commission, and which it is the bad but apparently incurable practice to fill with men without experience in railway management, the vast experience gained during service on the commission should argue very persuasively in favor of repeated reappointments.

A NOVEL PROPOSAL FOR INDUSTRIAL CO-OPERATION.

WE publish elsewhere a remarkably suggestive address on the railway labor situation by Fairfax Harrison, president of the Chicago, Indianapolis & Louisville, before the Indiana Young Men's Christian Association. Mr. Harrison's description and analysis of existing conditions will be accepted as both luminous and accurate by most of those familiar with these conditions. But the part of his address which will excite the most interest is that in which he proposes a new form of industrial co-operation on railways. His proposal is as follows:

> Calculate on experience what has been the percentage of the total pay roll of all classes of employees to the operating revenue in a given year or average series of years, and apply this percentage to current operating revenues to fix thereby the appropriation for pay of employees. The total appropriation, so made, would then be distributed among the several classes of employees in the percentages of their participation in the pay roll which was taken as the standard, and the individual would share in the appropriation for his class according to his services measured by agreed units.

The prosperity of a business concern depends not on its gross but on its net earnings. Practically all plans for industrial co-operation provide for the distribution of stock among employees. The return that can be paid on stock depends on the net earnings. Therefore, under most of such plans the employees, in so far as they are part owners of the property, are embarked in the same boat as the rest of the owners. If the industry earns profits they are profit sharers, if it earns losses they are loss sharers. The incurring of losses in which the employees participate has been the rock on which many schemes of co-operation have split. Furthermore, the financial interest that any one employee can obtain ordinarily is small. Therefore, even if profits are regularly earned, his dividends are almost certain to be so small compared with his wages that his interest in the amount of his wages will completely overshadow his interest in the amount of his dividends. So long as this is true, any plan of co-operation under which the employee participates only in the net earnings probably will not solve the labor problem.

Mr. Harrison's proposal is not really a proposal for profit sharing at all. It is a proposal for dividing the gross earnings regardless of the net profit or net losses. The percentage which the wages of employees as a whole have borne to the gross earnings would be calculated for a given year or for a series of years, and then employees as a whole would be paid this percentage of the gross earnings. If gross earnings increased, the absolute amount of wages paid would increase. If gross earnings declined, the absolute amount of wages would decline. Statistics for past years give a clue to the way in which the adoption of such a plan would affect wages. Since 1895 the percentage of total railway wages to gross receipts has varied from as low as 38.39 per cent. in 1901 to as high as 43.38 per cent. in 1908. When business suddenly and greatly increases there is a tendency for the ratio of wages to gross earnings temporarily to decline. When business suddenly and violently falls off there is a tendency for the ratio of wages to gross earnings sharply

to increase. The ratio declined from 41.36 per cent. in 1904 to 40 per cent. in 1906; and it increased from 41.42 per cent. in 1907 to 43.38 per cent. in 1908. The statistics indicate, however, that after the growth of business has continued steadily for a substantial period there is a tendency for the ratio of wages to gross earnings to begin to increase. This doubtless is because after the railways have been enjoying prosperity for a considerable period, the pressure of employees for increases in wages becomes so strong as to be irresistible, while their average efficiency tends to decrease, making it necessary both to employ more men to do a given amount of work and to pay higher average wages. So we find that while from 1904 to 1906 the ratio of wages to gross receipts declined, it rose sharply to 42.41 per cent. in 1907 in spite of the fact that the gross receipts of 1907 were the largest up to that time. On the other hand, when the railways have been suffering for a while from depression we find there is a tendency for the ratio of wages to gross receipts to decline. For example, it declined from 43.81 per cent. in 1908 to 41 per cent. in 1909. This was due to slashing economies which took chiefly the form of laying off men. In 1910, a year in which gross receipts again increased, the ratio was 41.82 per cent. and in 1911, although gross receipts declined, it was 42.2 per cent. If the average ratio of wages to earnings for a series of years were taken as the basis for the total compensation to be paid in each succeeding year the effect would be, if there was a slump in business, that the railways would not be able for a while to reduce their wage bill either absolutely or relatively as much as they can under the present system. On the other hand, if business steadily increased for a period of years the employees would not be able to get as large increases in wages during this period, either relatively or absolutely, as they could under the present system. The employees would suffer less from drastic reductions in numbers and in wages in hard times; and the railways would earn larger profits in good times than they do under the present scheme, and would, therefore, be better able to pay a larger total amount of wages in bad times.

The interest of employees, as a whole, would be not in the amount of net that the railways earned, but in the amount of gross; and this, so far as it had any effect at all, would tend to stimulate them to co-operate with railway officers in measures which, by increasing the amount of business handled and preventing reductions and securing advances in rates, would tend to increase gross earnings.

At present the employees' brotherhoods seek to secure, not only high average wages, but also employment for as many men as practicable. Under Mr. Harrison's plan the total amount to be distributed in wages would depend entirely on the amount of the gross earnings. In consequence the more men there were employed the lower would be the average wage paid. Would not this tend to cause employees to want as few employed as practicable and, therefore, to stimulate them individually to do as much and as good work as they could?

Thus far the greatest economies of American railways have been achieved by increasing the average trainload, and thereby holding down transportation expenses. If a railway management materially increases its trainload, and thereby reduces its transportation expenses as compared with its maintenance expenses, there is a relative reduction in the wages paid to employees in the transportation department—provided, of course, wage scales remain unchanged. Under Mr. Harrison's plan would it be possible to effect as large economies as at present by the same means as at present? Mr. Harrison's answer doubtless would be that as rapidly as economies are effected under the present system employees, and especially employees in the train service, demand and receive increases in wages that nullify the effect of the economies.

The constant effort of the managers of transportation and industrial concerns is to introduce methods and devices which by saving labor will hold down the amount that must be paid out in wages. Many of these improvements involve large increases in capital investment, making it necessary to earn more net to pay fixed charges. Would a plan under which a fixed per cent. of gross earnings went to labor, regardless of the labor-saving improvement made, be just to capital? Would it not interfere with the introduction of labor-saving methods? Two answers to these questions suggest themselves. First, labor is entitled to share to a considerable extent in the benefits derived from the introduction of labor-saving methods. Second, whether the labor on railways is entitled to share in these benefits or not, the fact is that in spite of all the improvements that have been introduced, the ratio of wages to gross earnings has tended to increase, indicating that the state of capital under the proposed plan would be no worse than its state under the present plan—or lack of plan—of fixing wages.

The principle underlying Mr. Harrison's plan is sound. The practicability of applying seems on first thought to be another matter.

BROTHERHOODS' PRESS BUREAUS ACTIVE.

THE conductors and brakemen now want more pay; or, at any rate their committees met recently at Rochester, N. Y., and gave out a long list of "demands," the chief of which were noticed in our last issue, page 958. The arbitrators of the eastern enginemen's wages have finished their meetings in Chicago, and their decision may be published before the reader sees these lines. No one seems to know much about what is to be expected, but whether the decision gives the engineman little or much, it will have to be looked upon by the railroads, apparently, as only the beginning of troubles; for these other classes of employees are standing by with sharp and watchful eyes. The firemen have already made their appointment for a conference; and now, as we see, the conductors and brakemen are ready to follow the firemen.

These trainmen's schedules, evidently framed with the approval of the "grand" leaders, are notable not merely for demanding "everything in sight"; they extend into the region of fancy. If a freight train is very long and heavy they ask to be paid double time! The editor of their press notice modestly refrains from saying whether this refers to the whole of a run or only to the over-time. Riding up (or down) a two-per cent. grade is also a severe strain on the nerves of conductors and brakemen, and is held to justify a 12 per cent. addition to the pay, if the schedule is correctly reported. The recognition of the piece-work principle is desired. Does this mean that we are to follow the principle out to its logical finality, as it is seen on the street cars in Broadway, New York, where there is always a conductor for every car? That would be scarcely less absurd than some of the things here proposed, apparently in all seriousness.

Can it be that the constituents of these committeemen would approve such crude and grotesque proposals as those here mentioned? The men who drafted them must have absent-mindedly assumed that they were drafting a "strike" bill for introduction in some legislature. Is it not about time to agree on some method of negotiation in which the presentation of exorbitant demands, for the purpose of offsetting expected exorbitant demands from the other side, shall be stopped? We have lately heard a good deal about unreasonable demands made by superintendents on the men who handle the trains, and some of the accusations seem well founded. Any superintendent who is unfair in this respect is bound to change his course simply as a matter of duty to his employers and to the public; he has no moral right to impose on a trainman in one matter, because he lacks the courage to prevent the trainman from imposing on him in another. And he has a duty here for another reason: every superintendent should clear his own skirts, so as to qualify himself as a consistent fighter for a return to normal and reasonable discussion on both sides.

The trainmen on the Southern Pacific lines in Texas are asking their employers for various things, among which are "longer lay-overs at home points," and a rule providing that local freight trains shall be run only in the day time; and, in

the lurid language of the reporter, the refusal of the company to grant these demands will result in a "tie-up" of the road from El Paso to New Orleans (1,191 miles). We notice this bit of news simply as another instance of the indirection which seems to characterize a large share of all the moves made by the brotherhoods. What is needed, of course, is not longer but more regular lay-overs. Too many lay-overs of 36 hours or longer are tolerated already. These, combined with the shortest legal rest-period at the other end of the line, make a working-time scheme—to be found on all our railroads—which for irregularity could be matched, probably, only in a lunatic asylum. As every one knows, the brotherhoods and the railways are jointly to blame for this condition. Why should day work and night work be so irretrievably mixed for all freight trainmen when at least half of the crews, probably, could have regular hours and the other half could have theirs materially improved? In England, cases where trainmen are on duty more than 12 hours at a time are noticed by the Board of Trade, on the presumption that so long a period may be inimical to public safety. In contrast with this, a prominent American railroad has recently established a freight run one hundred and fifty-seven miles long; and the trains do not average a speed of much over ten miles an hour. If these Texas men have any 16-hour runs, they are right in calling for a change of some kind; but longer lay-overs will not cure the evil. Demands of labor unions are usually made known to the newspapers, indicating a desire for public approval and sympathy. But there should be public knowledge, also. The public should know that when freight is dull, long "lay-overs" are unavoidable, unless some of the men are to be dismissed; that when the freight movement is brisk, the men are as ready to submit to short lay-overs, with the consequent increase in the figures on the payroll, as the superintendent is for the purpose of relieving the car congestion. Most railways naturally prefer to run local freights in the day time because thus they can meet the demands of shippers most economically; but most freight trainmen are glad enough to work nights if the extra pay is satisfactory. When a question of railroad wages is laid before the public the exhibit should include the whole of the question.

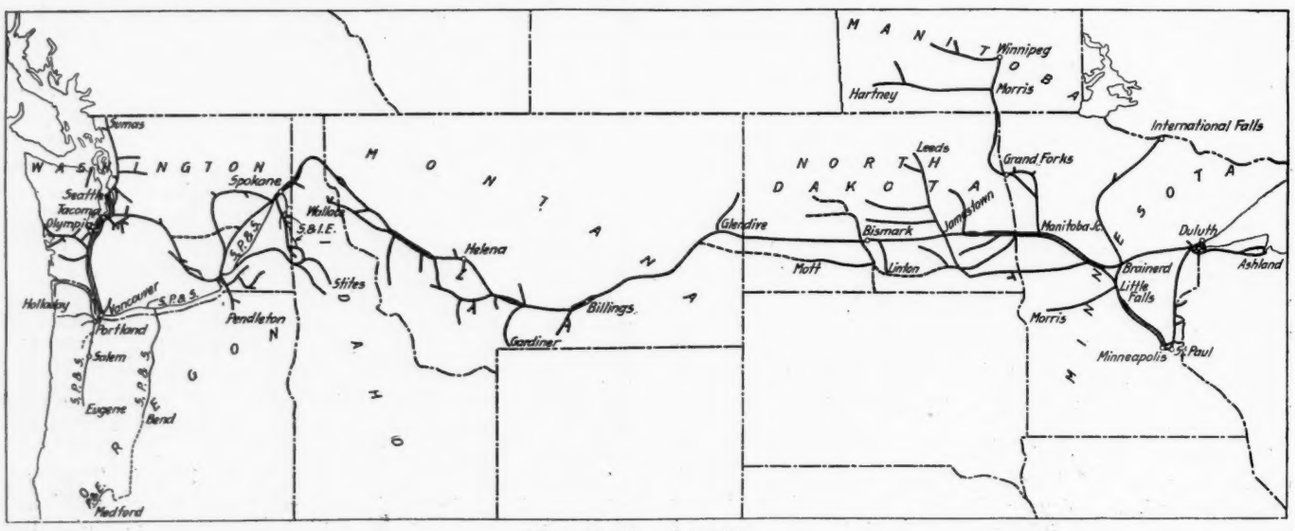
NORTHERN PACIFIC.

MOST of the larger railroads of the United States found the fiscal year ended June 30, 1912, one in which expenses tended to increase, and, with the exception of the soft coal roads and certain other roads affected by special conditions, gross earnings did not show a normal increase; in many cases they showed a decrease. Railroads operating in the Northwest have very unusually severe weather conditions to contend with. In addition to these difficulties, which other roads experienced, the Northern Pacific has had to a greater degree than any other road in its section to meet in recent years the competition of the Chicago, Milwaukee & St. Paul's new Pacific coast extension.

The total operating revenues of the Northern Pacific in 1912 amounted to $62,495,000, a decrease of $1,574,000 from the previous year and the earnings in 1911 were less than the earnings in 1910 by $9,695,173. The reduction in revenue has been due in part to poor crops in certain states, in part to the general depression of industry, and, as previously mentioned, in part to the competition of the St. Paul. All of these conditions were of such a nature as to be beyond the control of the management of the road. The problem, therefore, of the management of the Northern Pacific was to make the best possible use of the reduced resources at its disposal.

The Northern Pacific is a comparatively lightly capitalized road, much of the mileage of which is main line. It is a road which has been very largely rebuilt, in good part through earnings, during the past five or six years, and one on which the standards are high. In 1912 the company earned $10,526 per mile of road. Its operating ratio was 60.16 per cent. The ratio of transportation expenses to total operating revenue was 32.7 per cent. The ratio of the expenditures for maintenance of way and structures to total operating revenues was 12.4 per cent.; and the ratio of cost of maintenance of equipment to total operating revenue was 11.4 per cent. The road had last year a freight traffic density of 838,000 revenue ton miles per mile of road and a passenger density of 107,802 passenger miles per mile. The average receipts per ton per mile were 8.67 mills in 1912, a decrease of 3.99 per cent. from the year before, and the average receipts per passenger per mile were 2.362 cents, an increase of 3.78 per cent. from the previous year. It will be noted that the average ton mile rate is low; but since a large proportion of the Northern Pacific's traffic is furnished by lumber and other forest products, this comparatively low ton mile rate is in part offset by the fact that its traffic can be economically handled because it can be moved in large trainloads and on comparatively slow schedules. Of course, the Northern Pacific also has much high grade traffic moving on fast schedules.

The passenger rate per mile is higher than the average in the United States; but it is into the passenger business that the competition of the Chicago, Milwaukee & St. Paul, with its Puget Sound extension, has cut most deeply in the last three years. Passenger revenue in 1910 amounted to $21,333,313; in 1911 to $17,278,813, and in 1912 to $15,343,752. Freight revenue in 1910 amounted to $48,759,000, in 1911 to $43,333,000, and in 1912 to $43,794,000. During these years operating expenses amounted, in 1910 to $45,980,000; in 1911 to $39,729,000, and in 1912 to $38,159,000.



The Northern Pacific.

In the fiscal year ended June 30, 1912, the Northern Pacific earned $25,578,000 net revenue, and after the payment of taxes had $21,839,000 operating income. After the payment of rental, interest charges and its 7 per cent. dividend the company had $2,304,000 surplus, comparing with a surplus of $3,082,000 at the end of 1911.

It will be seen, therefore, that the Northern Pacific dealt with its problem of meeting a reduction in earnings by reducing its operating expenses, and the question arises as to how much of this reduction in operating expenses is due to an increase in operating efficiency and how much is due to deferred maintenance. Maintenance of way and structures cost $10,843,000 in 1910, $8,065,000 in 1911, and $7,861,000 in 1912, and maintenance of equipment cost $8,992,000 in 1910, $7,911,000 in 1911 and $7,208,000 in 1912. It would seem that this decrease in maintenance expenses must represent some deferred maintenance. Since 1907 nearly every road wast of the Mississippi river and a large number of those east have found it necessary to defer some maintenance work. A decrease on the Northern Pacific of $397,000 charged for depreciation of steam locomotives, or more than 50 per cent., a reduction of $80,000 in charges for depreciation on passenger train cars, and a reduction of $585,000 in charges for depreciation in freight train cars, this last also amounting to over 50 per cent., doubtless represent in good part reductions in charges in order to make a better showing in a year of unusual difficulties. The reduction, however, in cost of maintenance of way is due in good part to economy that has been effected by the work of the management. It is not always easy to trace such economy, or to separate decreased charges that are due to less work being authorized for the maintenance of way department and decreased charges due to greater efficiency in the use of track labor, etc. The actual cash outlay for maintenance of equipment was more in 1912 than in 1911. If there be deducted from this account in 1911 the amount charged to depreciation, the cash outlay for maintenance of equipment becomes $5,800,000; and, proceeding in the same way, the cash outlay in 1912 is found to have been $6,170,000.

In the examination of the details of transportation expenses and traffic statistics no such difficulty is met with. Here a reduction in expenses is a clear gain in efficiency, and as a matter of fact in the last three years no increase in expenses per unit—that is per ton mile, or per passenger mile—indicates an actual gain in operating efficiency of a considerable amount because of the increases that have taken place meantime in the cost of labor, the cost of meeting the requirements of state and interstate commissions and the cost of meeting more and more exacting public demands in the way of service. Transportation expenses amounted in 1910 to $24,045,000, in 1911 to $21,601,000, and in 1912 to $20,756,000. It is a well recognized fact that a reduction in passenger traffic cannot be met by a proportionate reduction in passenger service. The mileage of revenue passenger trains in 1910 was 12,575,000; in 1911, 11,380,000; and in 1912, 11,455,000. This is a reduction of 9.50 per cent. from 1910 to 1911, and of less than 1 per cent. from 1911 to 1912. The passengers carried one mile decreased 3.91 per cent. between 1910 and 1911, and 6.49 per cent. between 1911 and 1912. The maintenance of passenger service indicated makes the reduction in transportation expenses all the more remarkable.

Turning now to freight traffic the total ton mileage amounted to 4,801,000,000 in 1911, which is less by 11.41 per cent. than in 1910, and to 5,051,000,000 in 1912, which is more by 5.22 per cent. than in 1911, and not quite equal to the 1910 ton mileage. In 1910 the average trainload of revenue freight was 429 tons, in 1911, 461 tons, an increase of 7.49 per cent., and in 1912, 511 tons, an increase of 10.64 per cent. The average number of loaded cars per train in 1911 was 25.34, an increase over 1910 of 10.97 per cent., and the average number of loaded cars in 1912 was 26.94 per cent., a further increase of 6.31 per cent. over 1911. In 1912 the mileage of locomotives employed in helping passenger trains was less by 21.28 per cent. than in 1911, and totaled 614,000, and the mileage of locomotives employed in helping freight trains was less by 4.99 per cent. last year than the year before and totaled 1,123,000. This considerable gain in train loading and the elimination of helping locomotive mileage speak for themselves, and go far to explain how the management has succeeded in meeting the very difficult problem that it has faced in the last two years.

It seems safe to predict that the current fiscal year on the Northern Pacific will show an improvement over either of the last two, and probably over 1910. Business in the Northwest is now better than in a long time and the resulting increase in traffic probably will make it large enough to tax the facilities of all the roads, new and old, in that territory. The Northern Pacific's operating organization being now, judged by last year's results, the most efficient it has ever been, and its physical property being in good condition for economical operation, the consequence of the business awakening in the Northwest should be a large increase in the Northern Pacific's net revenue.

The following table shows the principal figures for operation in 1912, as compared with 1911:

	1912.	1911.
Mileage operated	6,032	6,017
Freight revenue	$43,793,522	$43,332,918
Passenger revenue	15,343,752	17,278,813
Total operating revenue	63,423,947	64,912,832
Maint. of way and structures	7,861,491	8,065,462
Maint. of equipment	7,207,716	7,911,231
Traffic expenses	1,202,293	1,127,233
Transportation expenses	20,756,387	21,601,477
General expenses	1,130,631	1,024,356
Total operating expenses	38,158,517	39,729,761
Taxes	3,739,079	3,296,797
Operating income	21,839,101	22,328,071
Gross income	26,870,945	27,668,506
Net income	19,663,815	20,442,267
Dividends	17,360,000	17,360,000
Surplus	2,303,815	3,082,267

NEW BOOKS.

Artistic Bridge Design. By Henry Grattan Tyrrell, Toronto University. 6 in. x 9 in.; 295 pages; 242 illustrations. Price, $3. Myron C. Clark Publishing Company, Chicago.

A phase of bridge design which is too little considered by American engineers is treated in this book, by Mr. Tyrrell, who is already well known as a writer on the design and construction of mill buildings and bridges. The practical experience of the author makes his treatment of this subject of more value than a designing engineer might at first thought believe it to be. Mr. Tyrrell does not advocate such theories as the building of plate girder structures in fantastic forms for the sake of art, but presents some practical suggestions for improving the appearance of railway and highway bridges without unnecessarily increasing their expense or decreasing their utility. More than half of the book is devoted to illustrations of existing and proposed bridges, the good points of which are briefly commented upon.

A Practical Treatise on Tunneling. By Charles Prelini, C.E., Professor of Civil Engineering, Manhattan College, New York. Sixth edition. 6 in. x 9 in.; 350 pages; 167 illustrations. Price, $3. The D. Van Nostrand Company, New York.

A practical treatise on tunneling must be revised frequently if it is to remain practical. New methods of tunneling are being rapidly developed, and during recent years the art has made considerable progress. In revising his former book on this subject Mr. Prelini has been keenly aware of this condition and has included valuable descriptions of recent tunneling operations which make the complete work an excellent treatise on this subject. The Hudson river tunnel of the Pennsylvania Railroad and the Detroit river tunnel of the Michigan Central are examples of recent construction which are described. More space than is common in such works is devoted to accidents and repairs in tunnels and relining tunnels, a feature which will, no doubt, be appreciated by many.

Letters to the Editor.

WALSCHAERT OR WALSCHAERTS.

Boston, Mass., October 25, 1912.

To the Editor of the Railway Age Gazette:

A few years ago the *Railway Age Gazette* took up the spelling of the above name with a final "s," but recently the "s" has been omitted. At that time I went to considerable trouble to ascertain the correct spelling, but found great difficulty in finding any evidence that the "s" should be used. I could not find any publication that, or person who, used the "s." Lawford Fry, however, gave evidence in a letter to you dated December 18, 1907, that the "s" is correct, by referring to a biography of E. Walschaerts, the inventor of the valve gear, by Prof. M. J. Boulvin, of the University of Ghent, a fellow countryman of the inventor. He also referred to the use of the "s" in a report of the Belgian members of the jury of the Paris Exhibition of 1878, which refers to the valve gear invented by Walschaerts and patented in 1844. I sought further evidence on the matter, and in November, 1909, Professor V. Dwelshauvers Dery, the eminent engineer of Liege, sent me the business card of the son of the inventor of the valve gear which reads,

Emmanuel Walschaerts,
25, Avenue de Cervueren,
Etterbeek, Bruxelles.

This settled the matter, and I think that the *Gazette* should be careful, hereafter, to use the final "s" in all of its articles in which the name Walschaerts appears.

F. W. Dean.

[Mr. Dean is right as concerns the name of the inventor of the valve gear, but the term Walschaert is so universally used by railway men in this country that it seems wise to make it standard in our publication rather than to use the term "Walschaerts."—Editor.]

TRUCK DERAILMENTS.

New York, November 7, 1912.

To the Editor of the Railway Age Gazette:

Some few years ago it was decided to locate the brake beams between the wheels of the truck and to hang them from the truck frame instead of the car body, as was necessary when they were hung outside. This definitely fixes the position of the brake shoe on the wheels and gives an even brake shoe pressure on the wheel for all car loads. However, it was found necessary to drop the brake beams down closer to the rails on account of the necessity of having the bottom connecting rods below the spring plank of the truck, which brings the entire shoe bearing below the center of the wheel without increasing the braking power. In view of the fact that the forward wheels of the truck, while moving, are rolling away from the brake shoe and tend to raise themselves from the rail, it would seem quite evident that the first application of the air brakes would (owing to the low position of the brake shoe) assist in this upward movement, and at times raise the wheels above the rails to a height greater than the depth of the flange, thereby causing a derailment. It is a fact that in most cases, if not always (barring obstructions, etc.), it is the forward wheels that first leave the rail.

Another condition known to exist is the great number of top arch bars that become cracked at the column bolt holes, the cause of which no doubt is this upward movement of the forward wheels that occurs at every application of the air, and which may not at the time be sufficient to cause a derailment, but yet gives a sufficient upward movement to cause a bending strain on the arch bar.

For these reasons it is believed that derailments are much more frequent with the low application of the brake shoes than when the center of the brake shoes was opposite the center of the wheel. At first thought, these views may cause incredulity, but a careful study of the situation will undoubtedly bear them out, especially as tests have shown that daylight can be seen at times between the forward wheel of the forward truck and the rail when running at a high rate of speed, indicating that the forward wheels have a lifting tendency. This is a theory that is deserving of careful consideration by railroad officials.

Mechanical Engineer.

THE HYDE PARK DERAILMENT.

Albany, N. Y., November 12, 1912.

To the Editor of the Railway Age Gazette:

In your issue of November 8, page 888, we have noted your comments on the reports rendered by the Interstate Commerce Commission, and this commission of the investigations conducted after the derailment of the Twentieth Century Limited, which occurred at Hyde Park on the New York Central & Hudson River Railroad on March 31 last.

There are several statements contained in your review which are not precisely in accordance with the facts, and we take the liberty of calling your attention to them. For instance, you say: "Mr. Belnap says that the drainage was poor, but like Mr. Vanneman, he does not go into details on this point." We beg to refer you to the last paragraph on page 21 of our report, where the following statement was made: "The drainage of the cut at the point of derailment was poor. The roadbed was frozen solid and there was a large pool of water directly at the point where the greatest irregularity of superelevation appeared. The ditch on the west side was choked up with snow and ice." It should be entirely obvious that these conditions could exist only at points where the drainage was not strictly good, and how it would be possible to go into further details to indicate more definitely that the drainage was not good, is not clear.

In the foot note you state that the vice-president of the New York Central pointed out to the commission that readings taken by his engineers disagreed with those taken by our Mr. Vanneman to the extent of 15/16 in., and also we note comment was made relative to Mr. Smith's criticism. Your reviewer undoubtedly failed to catch the point in Mr. Smith's criticism, or did not compare it with the figures which Mr. Vanneman gave, for had he done so, he would have seen that Mr. Smith's statement is that reading No. 7, which is shown as 3 1/16 in. was exactly 4 in., and reading No. 7 was taken within 15 ft. of another reading, which was not questioned, of 2¾ in., so that Mr. Smith's statement is a very strong argument in support of the conclusion which our engineers reached. Obviously, comment on his criticism was not appropriate.

Again you state, with reference to the superelevation measurements taken by the Interstate Commerce Commission that—" . . . the length, 600 ft. is greater than that inspected by the New York inspector." A reference to the figures submitted will show distinctly that the superelevation was practically uniform at the point at which the reading was started. As a matter of fact, the readings were taken a considerable distance north of the point of accident, perhaps 300 or 400 ft. It was not considered necessary to go back any further on account of the uniformity exhibited, and the fact that 600 ft. was used is no addition to the argument.

These points are called to your attention simply for the reason that it is not believed that your reviewer got all the facts in connection with this accident.

J. E. Sague,
Public Service Commission, Second District.

PROGRESS ON THE GRAND CENTRAL TERMINAL.

Description of This Project, the Most Important Unit of Which Is Now Nearing Completion, with Details of Construction.

The most extensive passenger terminal development which has ever been undertaken in this country, if not in the world, is that of the Grand Central terminal in New York, which is now nearing completion, and which is being built by the New York Central & Hudson River for its use jointly with the New York, New Haven & Hartford. This project is unusual for the expenditure involved, now estimated at over $180,000,000 as well as for the fact that the tearing down of the old structures and the building of the new are being accomplished while maintaining uninterrupted service for the very heavy passenger traffic of the two roads; this traffic reaching over 800 trains and over 2,200 movements through the yard daily.

The Grand Central terminal development embraces a number of buildings in addition to the station proper. With the substitution of electricity for steam on the terminal divisions, it became possible to cover over the tracks. The area required for the tracks in the train sheds extends from Forty-second to Fifty-seventh streets, and from Madison to Lexington avenues, comprising about 46.2 acres. The station buildings themselves require only a small part of this space above the tracks. To secure a return on the rest of this expensive property, which is located in the heart of up-town New York, a group of semi-public buildings are being erected, the returns from the leases of which will repay in part the interest on the land investment. This feature in itself marks the project as different from the usual type of terminal where no attempt is made to capitalize the space above the tracks and to develop the terminal as an investment.

The buildings which are definitely planned include two hotels, an office building, the Grand Central Palace for wholesale furniture displays, the Adams Express Company building, apartment buildings, clubs, etc. When the plans are entirely worked out it is expected that the entire area from Forty-second street north as far as Fiftieth street will be covered with high class buildings. At the present time a seven-story office building has been completed for the use of the two railways entering the terminal, and it is in service. The Grand Central Palace and the Adams Express Company building have been completed and in service for several months, while the excavation is nearing completion for the new $5,000,000 Biltmore hotel.

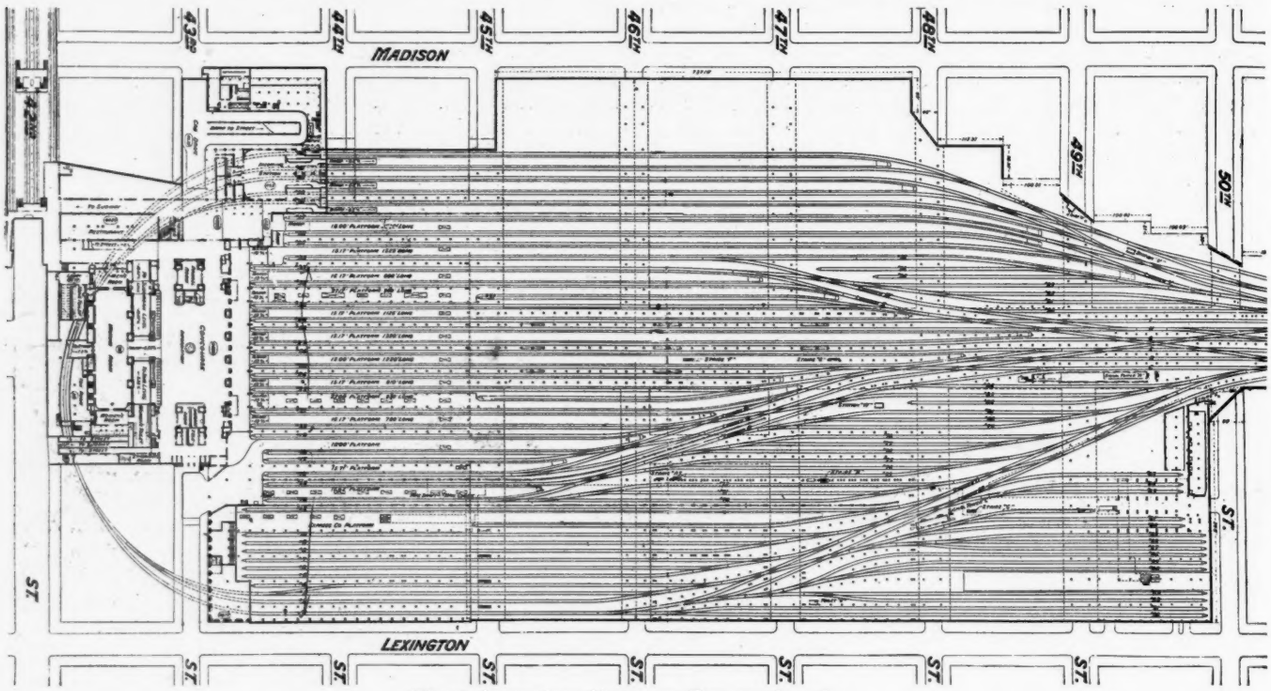
The Old and the New Structures on Opposite Sides, with the Excavation in the Center. New General Buildings in the Rear.

The station itself will be divided between outbound and inbound buildings. The outbound building is now approaching completion and will be opened about January 1, after which work will be started immediately on the inbound station. The details of the outbound station will not be discussed at this time, but will be described in a later article. The tracks in the terminal are divided between two levels; the express or through train level being about 20 ft. below that of the adjacent streets, while the suburban trains come in on a level about 24 ft. below that of the express floor. The leads to the suburban tracks come to the upper level between Fifty-third and Fifty-fifth streets, where the express and suburban tracks join.

PROGRESS OF THE EXCAVATION.

Construction work on the new Grand Central terminal was started in August, 1903, and has been prosecuted continuously

ever since. Because of the necessity of maintaining traffic without interruption it has been possible to withdraw only a small portion of the area of the old terminal from service at any one time, and it has been necessary to complete work on a corresponding section and put it into service before another portion

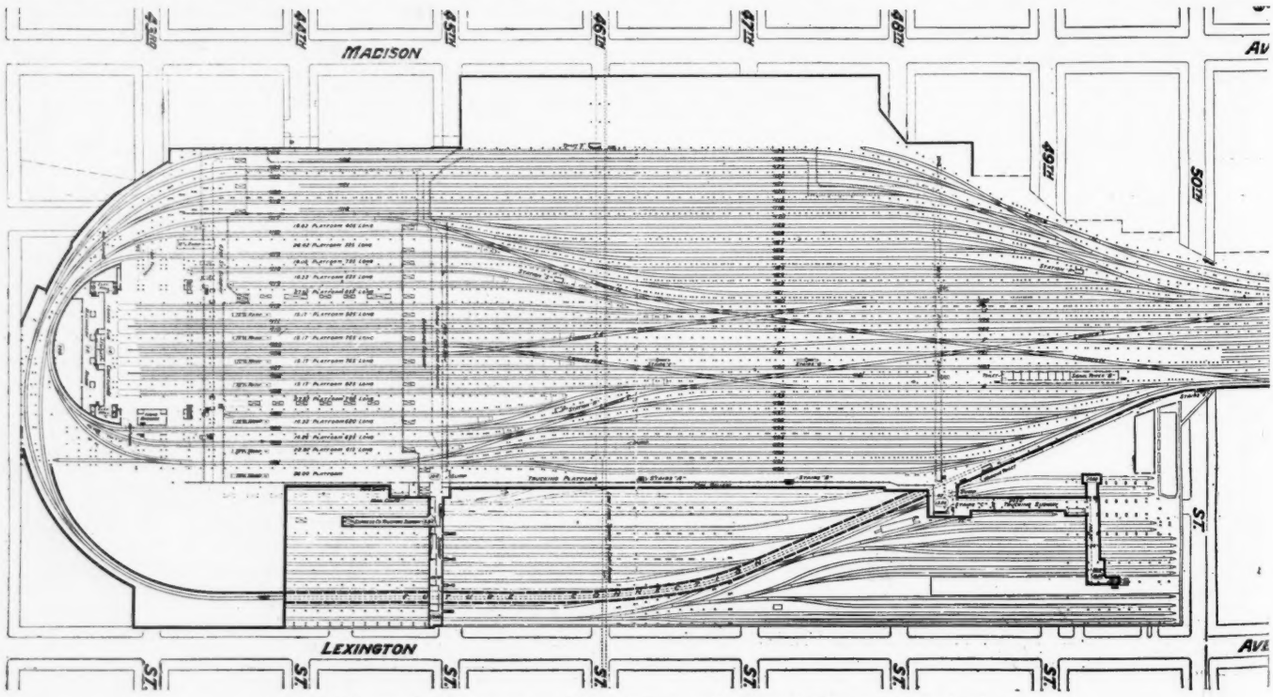


Track Layout on Upper or Express Level.

is disturbed. In this way the old terminal has been gradually replaced by the new until the last tracks in the old station were taken out of service on June 21, 1912.

The heaviest and most difficult single item in the construction work has been the excavation. The track level in the old terminal was only a few feet below that of the adjoining streets. In designing the new station it was necessary to lower the express level to pass beneath the streets south of the Park avenue tunnel, and with the separation of the suburban tracks it was necessary to place them below the express level. North of the terminal the tracks were lowered as far as the entrance to the Park avenue tunnel in order to separate all grades at street intersections, thereby permitting a number of streets to be opened which had heretofore been closed. In fact, the area over the tracks will be entirely covered as far north as Fifty-sixth street.

The total estimated quantities of materials to be removed are, 24,309 cu. yds. of old masonry; 1,862,646 cu. yds. of rock, and 1,207,796 cu. yds. of unclassified material, or a total of 3,094,751 cu. yds. Of this 23,393 cu. yds. of old masonry, 1,322,773 cu. yds. of rock and 985,653 cu. yds. of unclassified material, or a total of 2,331,819 cu. yds., had been removed on July 1, 1912, leaving 762,932 yds. still to be moved. The average depth of



Track Layout on Lower or Suburban Level; Grand Central Terminal.

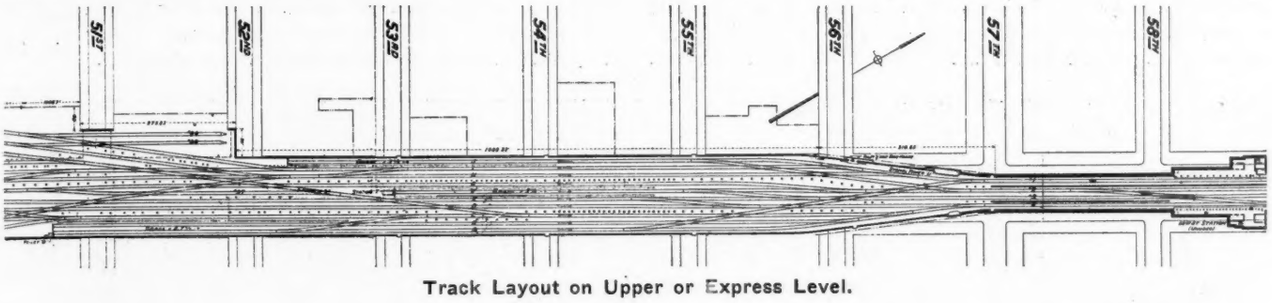
excavation is 50 ft., and is mainly in rock which is overlaid with from two to 25 ft. of earth. The larger portion of the material is being hauled north of the city, where it is used for bank widening and for the construction of additional main tracks on the Harlem and Hudson divisions.

The rock lies in strata dipping to the west, and is fairly solid, although in some places it deteriorates on exposure to the weather. It breaks up well in blasting. This material is loaded by steam shovels or by locomotive cranes onto flat cars. These cars are hauled by steam locomotives, these being the only locomotives working under steam in the terminal. They are used here because of the inconvenience, and expense of the continual shifting of third rail tracks about the work and the danger of men working in close contact with them. In many cases the steam shovels work on three different levels before reaching the proper depth, and in one or two cases, where the space was limited, the shovel working on the upper lift was forced to drop material over the bank for the shovel on the lower lift to pick up and load. Locomotive cranes are used to a large extent to load rock, eight Browning cranes being employed in addition to eight derricks. By their use it is not necessary to break the rock as finely as for the shovel, although the yardage loaded is, of course, much less.

The entire rearrangement of grades introduced many complications in the handling of the work, especially in keeping the revenue trains moving. This was especially complicated in the narrow throat of the yard at Fifty-sixth street, where the tracks were lowered to the new level between one Saturday night and the following Monday morning. Another difficulty was introduced by the presence of adjacent buildings. This terminal is located in a well built up business and residential section, and is surrounded by many high buildings. For this reason it is very necessary to carefully limit the blasting to prevent damage to these structures. Over 750,000 lbs. of dynamite have been used, this being stored and handled under the supervision of the city authorities. It was also necessary to carefully shore up adjacent buildings while the rock below was removed. In a number of cases heavy retaining walls as much as 45 ft. in height have been required to serve as foundations for buildings constructed close to the property line. Difficulties of this nature were especially numerous along the east and west sides of Park avenue during the early progress of the work. One of the accompanying photographs shows typical work of this nature near Fiftieth street. In most cases the customary methods were adopted of supporting the walls on steel girders or beams until new foundation walls could be built. In a few instances where settlement might occur, but where the foundations were not directly exposed, caissons were driven to rock or to a depth such that the lateral resistance was sufficient to carry the load.

TRACK LAYOUTS ON TWO LEVELS.

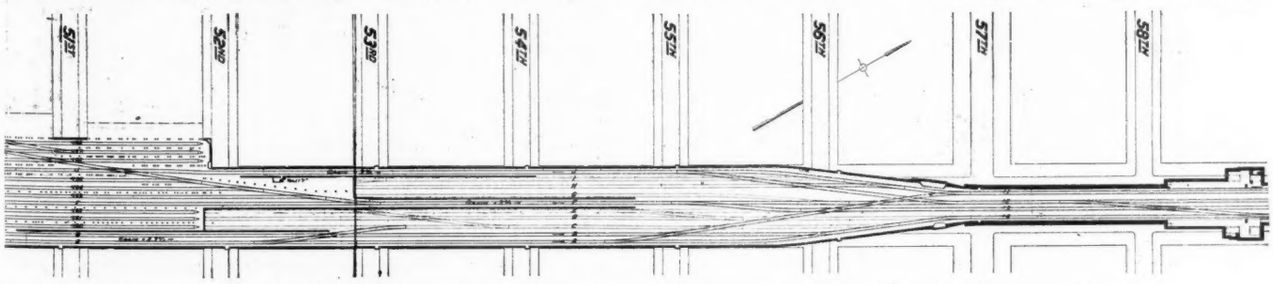
The accompanying plans show the track layouts for both the express and suburban levels. The area occupied by the express level equals 46.4 acres, and the plans provide for 19.5 miles of track. There are 42 tracks on this level, of which 29 are adjacent to platforms, while the total length of these tracks along platforms on this level is 28,850 ft. Inbound express trains will be diverted at either Fifty-seventh or Fifty-second streets to ladders leading to the five westerly tracks. These tracks connect with a loop running under the inbound and outbound stations and back along the east side of the yard. After unloading passengers, inbound trains will be run around this loop and be placed in storage yards on the east side of the yard for cleaning and restocking with ice, linen, etc. The use of this loop will relieve the congestion at the throat of the yard materially by cutting in half the movements at this point.



Track Layout on Upper or Express Level.

Immediately east of the inbound tracks are located 22 stub end outbound tracks, while east of these there are 11 tracks for the loading of baggage, mail and express, and for storage, with three running tracks beyond connecting with the loop. Between the ladders leading to the outgoing tracks and loop tracks, there are two storage yards for equipment, while the third yard for similar purposes is located in the corner near Fiftieth street and Lexington avenue. A total storage capacity of 1,050 cars is secured on this and the lower level.

Connection is afforded from each track entering from the north to every track in the yard by crossovers in each direction, providing flexibility of operation. Six tracks lead north from the express level to Fifty-seventh street, combining between Fifty-third and Fifty-fifth streets with four tracks from the suburban level into a four track system leading north through the Park avenue tunnel.



Track Layout on Lower or Suburban Level; Grand Central Terminal.

The suburban level is immediately below the express level and covers 32.8 acres of ground, occupied by 14.1 miles of tracks. There are 25 tracks, of which 17, with a length of 13,000 ft., are adjacent to platforms. Two loops are provided on this level, the larger one being used by the regular equipment, while the shorter one of 136 ft. radius will be used by the multiple unit trains. The suburban equipment will all be stored in two yards immediately north of the ladders leading to outbound tracks.

Only light cleaning will be done here, the heavier work being done at the outlying terminals. The track arrangement provides that trains can be backed directly from the storage yards onto the departure tracks without passing through the throat of the yard. Entrance to this level is secured on two tracks, one on the west and one in the center of Park avenue, both of which are on 3.0 per cent. descending grades. Outgoing trains move on two tracks near the east side of Park avenue on a 2.7 per cent. ascending grade.

The track construction consists of a layer of concrete 20 in. thick under the rails, and sloped slightly towards the center to facilitate drainage, in which creosoted blocks 5 in. x 9 in. x 30 in. long are embedded under each rail projecting 1 in. above the concrete. These blocks are spaced 19 to the 33 ft. rail.

work proper was 352,051 cu. yds., of which 175,000 yds. had been placed up to July 1. In addition to building retaining walls, foundations and footings of this material, all exposed steel work is being covered. On the vertical members wooden forms are used, but on the horizontal beams where the form work and the placing of the concrete are more difficult, a cement gun is being used with excellent satisfaction.

The amount of steel required for the terminal is estimated at 120,622 tons, of which 68,595 tons are for structures supporting the tracks and viaducts. Of this latter amount 42,000 tons had been erected up to the first of July. The erection of the steel work follows in general well established standard practice modified only to the extent necessary to meet local conditions, especially with reference to building one section at a time.

The Last of the Old Terminal at the Left and Steel Work of the New Terminal Being Erected at the Right.

Screw spikes and heavy tie plates are used. The tracks are laid throughout with 100-lb. rail and reinforced manganese frogs, and switch points are used in all turnouts.

High platforms level with the car floor have been built on both levels. This item for the main level alone involves an outlay of over $100,000 above the cost of the low platforms, but affords more rapid handling of passengers. These platforms are built of reinforced concrete with the top surface colored to secure pleasing effects. They are 4 ft. above the top of the rail and have a minimum width of 15 ft. Thirty platforms in all will be built with a total length of trackage adjacent of over 7.9 miles.

The estimated amount of concrete required for the terminal

SPECIAL DETAILS DEVELOPED DURING THE CONSTRUCTION.

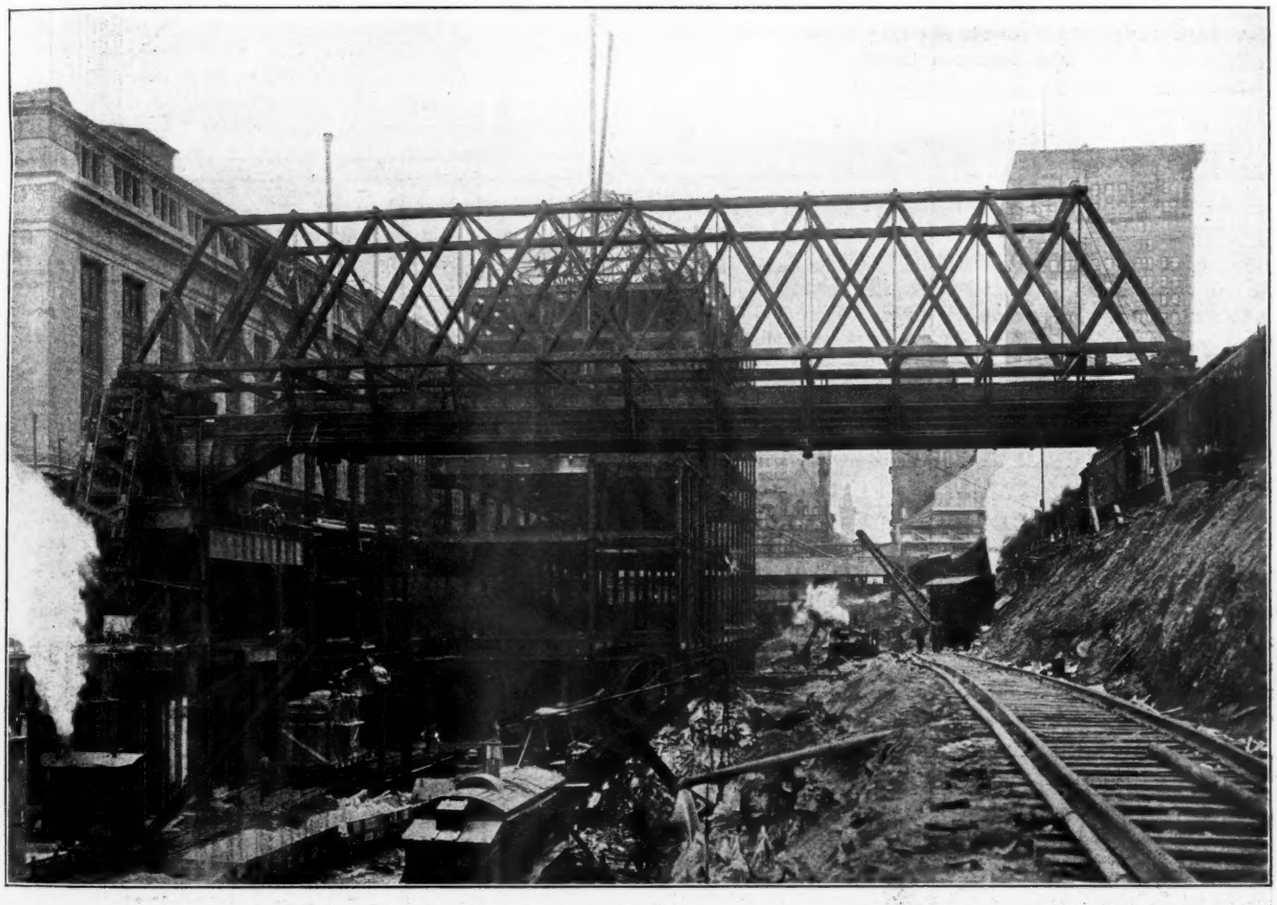
One interesting incident during the erection of the steel work occurred when settlement was noted of one of the columns supporting the Park avenue viaduct which was supported on a concrete spread foundation. While this settlement was not excessive, it was thought best not to run any chances. A well drilling outfit was secured and four 12 in. holes sunk on opposite sides of the column through a pocket of earth and about 5 ft. into the rock. Cast iron casings were put down as the work progressed and when the drill was withdrawn the casings were filled with concrete. On these four caissons an I-beam grillage was built and the columns supported on this.

The construction of the viaducts across the streets introduced

a number of very difficult problems. About 9,400 lineal ft. of viaducts with a floor area of 15.4 acres will be built in all. The principal problems in connection with these structures arose in meeting the requirements of the city that foot bridges be kept open during construction. The blasting incident to the excavation and the constant shifting of tracks made this a source of continual difficulty. The method adopted for the handling of traffic during the construction of the Forty-fifth street viaduct is typical of that used in a number of instances, although in this instance the problem was complicated by the necessity of maintaining in service a 30 in. gas main. A Howe truss of 172 ft. span was designed and erected with one end supported on a timber bent built on the edge of the proposed excavation, and the other end supported on a bent erected between two tracks in the old yard where excavation had not been begun. From the lower chords of this truss the foot bridge and gas main were supported, as shown in the accompanying drawing. By this means a clear space was provided below of sufficient width to allow the excavation to proceed. When the rock in the larger portion of the area beneath had been removed a new temporary bent was erected near the face of the excavation near the middle of the span. Rails were laid parallel to the truss on this pier and on the pier in the old yard, the trusses were jacked up and supported on wheels running on these rails. The truss was then moved forward slowly until the free end reached the third support. A new support was erected further over in the yard, the truss lowered, new approaches for the foot passengers built, and the process repeated, the permanent steel work following the excavation closely.

The removal of the old train shed under traffic introduced some very interesting features. When the station was planned it was expected that traffic would be entirely removed from the old building. The growth of business, however, prevented this, so it was necessary to remove the structure over the heads of passengers. A large moving traveler was built, which conformed closely to the contour of the train shed. This traveler was floored over and was mounted on wheels which moved on rails laid on the platform below. With this traveler the train shed was removed in sections and lowered to the platform during the day. At night refuse material was lowered from the traveler platform to cars and then shipped out. This entire shed with a span of 200 ft., and height of 90 ft., was lowered in this way without injury to any passengers.

The depth of the suburban level was such that much water from the surrounding property was drawn into it while the elevation of the pit was such that no outlet could be secured through the city sewers. Accordingly it became necessary to construct a sewer 6 ft. in diameter from the terminal site to the East river, 3,000 ft. distant. This sewer was driven as a tunnel and passed through rock most of the way, although at one point where it crossed under the elevated railway, a pocket of quicksand was encountered, requiring very careful work. Owing to the light grade of this sewer (0.2 per cent.) sediment tends to collect, and to remove this a swinging dam has been inserted which when closed stores up water which is used for flushing out the sediment by a quick release of the dam. This sewer was built early in the construction and has greatly facilitated the excavating, as it has been possible by this means to keep the pit free from water at all times.

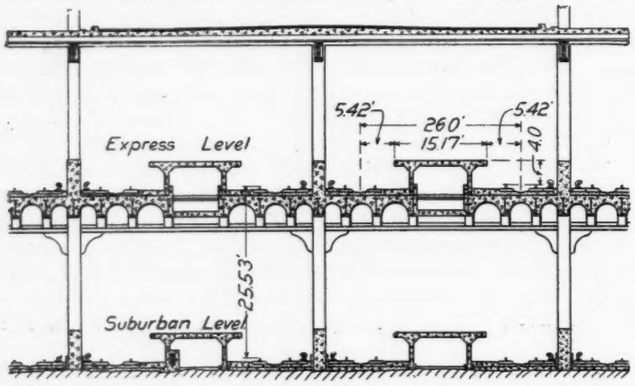


Bridge for Foot Passengers at Forty-fifth Street Supported by a Howe Truss.

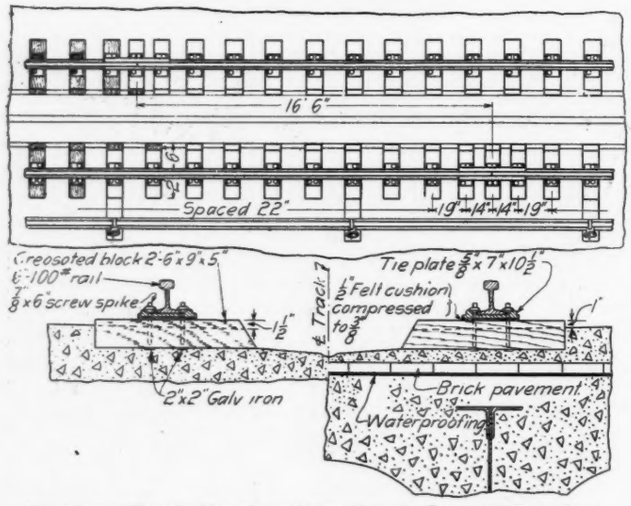
Two interlocking towers are located at Forty-ninth street, in the centers of the upper and lower level yards. Both machines are all-electric, the one on the upper level having 350 levers, and the other 400 levers—the latter being the largest all-electric interlocking machine in the world. These two towers control the movements from the throat into the various station tracks. A third tower is located at Fifty-seventh street, near the junction of the upper and lower levels, while a small tower is located along the ladder leading to the storage yard in the northeast

corner of the express level, and a tower is provided for the upper and lower loop tracks.

A water system with complete fire protection apparatus and

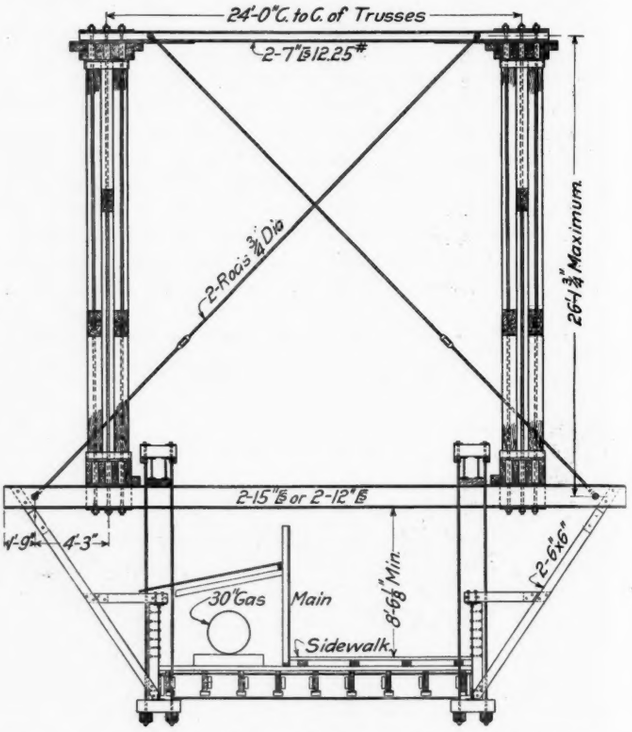


Section Through Train Shed, Showing Relation of Express and Suburban Levels.



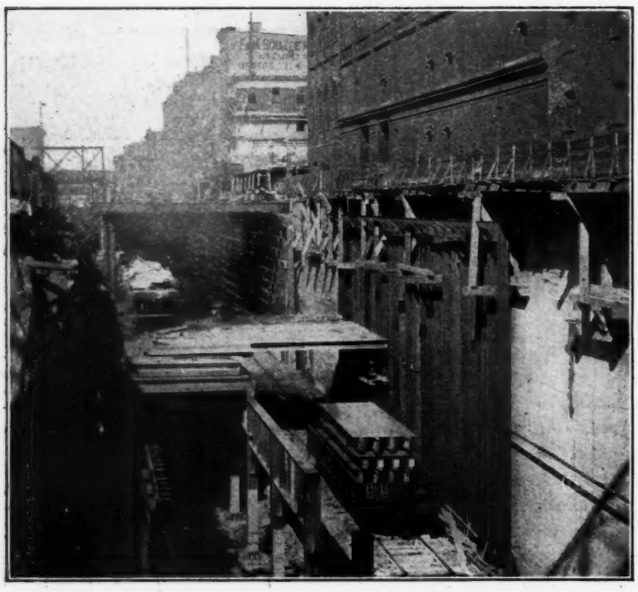
Standard Track Construction; Grand Central Terminal.

a station fire department are provided. Nearly 300 hose reel connections and 125 fire alarm boxes are distributed over the terminal. A sub-station is provided to stepdown the current received from the power house at Yonkers and Port Morris at 11,000 volts to a voltage suitable for the proper lighting of the station. In addition to a duplicate lighting supply, 10 per cent. of all the lights are carried on an independent system to prevent the station being left in total darkness at any time.



Howe Truss Supporting 30-inch Gas Main and Sidewalks Across Excavation at Forty-fifth Street.

This work has been handled under the general direction of G. W. Kittredge, chief engineer, New York Central and Hudson River; G. A. Harwood, chief engineer, electric zone improvements; and W. L. Morse, terminal engineer. W. F. Jordan, manager Grand Central Terminal improvements, has been in charge of the forces handling the excavation, masonry work, etc., and J. L. Holst, engineer of structures, has had charge of the designing of the steel work, exclusive of the buildings.



Underpinning a Building Near Fiftieth Street Closely Followed by the Erection of Steel Work.

Shovel on Upper Level Casting Material in Front of Lower Shovel.

A PLAN FOR INDUSTRIAL CO-OPERATION.*

Basing Wages of Railway Employees on Gross Earnings Proposed as a Substitute for Present Means of Settlement.

By Fairfax Harrison,
President, Chicago, Indianapolis & Louisville.

I. THE INDUSTRIAL CONFLICT.

Conflict seems to be necessary to the human animal with red blood in his veins. It keeps him from stagnation, it develops him mentally and physically, stimulates him to invention and sustained effort; in a word, it creates in him ambition. Our whole social system, and, indeed, many of our laws, have been built upon the recognition of conflict as a natural regulative force: to illustrate from contemporary politics, we insist upon industrial competition and prohibit monopoly; the law prescribes war, not peace. For this reason the social theories and experiments, which have rested without qualification upon the principle that all men are equal, have failed; equality before the law is a great and enduring achievement of our ancestors, but equality of career is almost a contradiction in terms; the right to fight for such reward as his individual equipment and industry may earn, to take his chance of success or failure, is as much as a virile man ever asks, but he does ask that. It was the assertion of this right which precipitated the conflict, now a century old, in which our American railroad industry is still engaged, but under conditions almost reversed. It is the conflict between capital and labor which has been waged since the organization of modern industrial society, and it represents the most important phase of the railroad question today, more important than what freight rates are or are to be, more important than car supply and the volume of traffic, more important than the relation of public opinion to the railroads. It is the vital question, and on the proper solution of it, which means the substitution for the existing civil strife of some other and more economic conflict with a common competitor, depends the future of the American railway industry.

At the beginning of the nineteenth century capital was all-powerful and soon abused its power. It controlled the machinery of government and it made public opinion. The economic literature of the day was all capitalistic and some of its conclusions are as revolting to us, who are engaged in industry today, as are the other extremes of the contemporary syndicalists. The pendulum soon began to swing. To secure a just recognition of its rights, both as human beings and with respect to its contribution to the success of industry, labor found and put to its service the principle of collective bargaining. It was an effective weapon. With its aid the labor unions grew in power until the conflict became an equal one. Occasionally war was necessary, but usually diplomacy was sufficient as the parties grew to respect one another, and at that moment substantial justice was probably done by both. The next stage marked a change in the balance of power, and today the condition of the railway industry in the United States illustrates a tendency to abuse of power by that one of the parties who was at first abused. He who was despised now despises. We are living in the midst of a process of steadily increasing transfer of the fruits of the railway industry from capital, which once enjoyed them, to labor; not to all labor engaged in the industry, it may be noted, but to certain powerful classes of labor. The honors of war may be said to be even; there are those on both sides who have suffered, and both parties are today faced by a common risk. It behooves both capital and labor, therefore, to find a new vent for the human appetite for conflict and to join forces for their common good.

II. THE EVIL CONSEQUENCES TO INDUSTRY OF THE EXISTING CONFLICT.

Perhaps the greatest evil of this conflict is visited actually or potentially upon the public, which is entitled to a uniform and uninterrupted conduct of the transportation facilities on which it depends more and more every year, but it is not proposed to go into that important phase of the question here. Our subject is the effect upon the parties to the conflict.

There are three recognizable consequences of this conflict which have had an evil effect upon the capital invested in railroads and as many of injurious effect upon labor. Let us examine them in turn.

Not the least element of the growing strength of labor in this conflict is that labor is today popular, in the sense in which control of political policy is accomplished in a progressive democracy by what is popular. It represents votes and is heeded by legislatures. Its attitude of conflict with the management of the railways, which represent the capital invested in them, was not the cause of the assumption of the power of regulation of the railways by government; the managers themselves are responsible for that, but, since regulation became an accomplished fact, the activity of labor in the legislature has been the inspiration of many of the laws of unnecessary and oppressive regulation which have been enacted. I am myself an advocate of regulation of the railways by government, but I am unable to blink the fact that what we have had has not always been what we may fairly expect to have, the regulation which considers all alike. In the period of adjustment of the last few years the experience of every railway manager has been that many of the measures of regulation of railways have been futile and merely wasteful of money sorely needed for improvement of facilities which have in consequence been postponed. Many of these measures have originated in mere opportunism of the politician, who, seeking to commend himself to his constituents by adroit insistence upon minor wrongs, secures the enactment of a general law prescribing an invariable and expensive practice for the operation of all railroads, the suggestion for which had its origin in the failure of a particular railroad in respect of its handling of a particular shipment; but there are those also, and they are not few, which have been the direct consequence of the conflict of labor and capital. The managements of the railways have not been esteemed by legislatures in recent years for historical reasons which are not creditable to either of them, and it has been as easy for organized labor as for the ambitious politician to secure the passage of a law to make a railroad wince.

But more serious than this is the effect upon the railroads of the steady demands of labor for fixed and invariably increases of wages. There is no railway manager today, I venture to assert, who does not want all his employees to be well paid, to share in prosperity when prosperity exists, and to be rewarded by promotion for efficient and loyal services. If he is not able to give this feeling expression in all deserving cases it is because his constant cost for the numerically most important classes of labor has increased in greater proportion than the increases of revenue out of which that cost must come. The margin necessary for the successful administration of any industry has been thereby progressively narrowed, until the point of danger to credit even of the most prosperous roads is now distinctly visible, as any one can testify who has railroad securities for sale which he bought ten years ago. This is a situation which would be difficult in an industry which could stand still, but in an industry of which the life is growth, it discourages those who are invited to risk the new capital necessary to make even the improvements, which by increasing efficiency, will reduce expenses and so widen the margin again; much less will the funds be forthcoming for the improvements

*An address before the Indiana Young Men's Christian Association, at Hammond, Ind., November 22.

demanded by the public for comfort and convenience. In the end the tendency jeopards the very capital already invested.

Another consequence of the conflict in its effect upon capital is perhaps irrevocably accomplished already. It is the change which uncertainty of income has had upon the point of view of investors. Time was when railroad stocks were a favorite form of investment, not only because they promised substantial profit by increment of value, but because they spelled stability of income. Today railroad stocks are not in favor, and whenever money is now invested in railroads (except in extraordinary cases, each of which has its historical explanation), the form of investment is the bond. In other words, the investor is no longer a partner in the business, or, to use the good old Elizabethan word, an adventurer; but has become a money lender. He prefers the right to foreclose a mortgage to an uncertain chance of a profit secured by good management and efficient operation. The capital already invested in the original construction of a railway suffers the consequence of this change of investing opinion, for it must now stand as the margin of the new investor and must risk being wiped out for his benefit and security. Whenever, as has happened in recent years, a railroad is faced by unconcerned and unyielding demands of labor at a time when it is unable both to respond to them and to maintain its credit, this risk is imminent. It is a consequence of war.

As it concerns labor, the conflict is not less dangerous in its consequences. We hear much today of the increased cost of living. It is urged as a ground for advancing wages, even when the inability of the industry to do so and continue to prosper is apparent. The argument is that those who produce what the industry markets are entitled to the first consideration in the provision of the necessaries of life, and where that argument is supported by facts it is most persuasive. It is not, however, as sound an argument in the railway industry today as it was some years ago. While the cost of certain necessaries of life has indubitably increased, the scale of living of the railway employee has increased in greater ratio, and not the least factor in this has been the increases in railway wages. This is the vicious circle of prosperity. I read the other day an old book, Robert Wallace's "Dissertation on the Numbers of Mankind," published in 1753, before the days of political economy, and there came upon a suggestive comment on this subject:

> "Operose manufactures of linen, wool and silk, toys and curiosities of wood, metals or earth, elegant furniture, paintings, statues, and all the refinements of an opulent trading nation, tend," he says, "to multiply men's wants, make the most necessary and substantial things dearer and in general increases the expenses of living."

This is an eighteenth century expression of a thought which an American of our time, who represents in his own life the success of individual initiative, industry and economy, has well phrased in the notable epigram that "It is not the high cost of living from which we suffer but the cost of high living." There is many an American railway employee who, if he searches his heart, will admit that the large increases in wages which have been secured for him in recent years have brought him very little real comfort. I was talking the other day with a locomotive engineer who was thirty-five years old and has drawn handsome pay for most of his industrial life. He told me that his father, who had been a runner on the same road, had saved and left behind him $6,000, living meanwhile a self-respecting life on very much less wages than his son now gets. "Not only have I been unable to save anything," said the son to me. "but I have spent some of the old man's savings."

"What did you do with your last increase in pay?" I asked.

"Well, my wife said that the neighbors thought she should have a silk dress, and the girls wanted a piano, and so it went; in the end I did not find myself any better off than I was before."

This means, if it means anything, that the present position of labor in its conflict with capital is deemed to justify the expectation of continued increases in pay without regard to industrial conditions, an assurance which breeds habits of extravagance which are harmful to the individual. In other words, the increased pay is a factor in creating the high cost of living.

As the conflict is now waged, the lion's share goes to the most powerful organization, and the weak among the employees alone suffer. It is an indisputable fact that some classes of railway employees are now highly paid, both actually and relatively, and that other classes are not on the same basis in proportion to the value of their services. This is an inequality in the same industry which one can understand is intolerable to a spirited man, and indeed produces some of the worst consequences of the present system, both upon the employer and employee, but chiefly upon the latter.

Finally, the present system which required in the beginning a well disciplined and cohesive organization for self protection, now results sometimes in stifling the ambition of the individual by an assurance of drab uniformity of treatment. It is not necessary to press the point. The warmest advocates of conservatively managed labor unions, and I am proud to include myself in the number, recognize the danger and the risk of this necessity of the system.

What, then, of the future, if the present conflict continues?

For the management of industry the conflict has been a stimulus to greater efficiency and the economical investment of new capital. As the wages of labor increased, an attempt to offset the increased expense by economy in operation has resulted, and vast sums have been spent, for example, in reducing grades and increasing power, to secure greater unit train loads, but the limit to this kind of economy is in sight, if it has not been reached. The candid fact is that although other branches of industry are at this moment enjoying great prosperity, the railroads, doing the largest business in their history and passing through their treasuries the largest revenues they have ever realized, are in a more precarious condition than ever they have been, such is the burden of their expenses. It is absolutely necessary to the railroads that something shall be done to relieve the present tense situation and enable them to face the future with confidence, and I believe that the way to accomplish this is to settle the conflict of labor and capital in the railway industry on an enduring basis. Other remedies are mere salves on that sore.

For labor also the future is not assured under existing conditions. Already there have been expressions of discontent on the part of other classes of the community with what they call the preferred position of railroad labor. The most industrious and successful farmers and storekeepers in the country along the line seldom make as much net money in the year as do the railway employees stationed at those towns, and nothing like as much as those they see going by on the trains. They are, however, a large numerical majority of those who pay freight charges, and they now complain against the freight rates largely because they think these rates might be less if such relatively high wages were not paid to certain classes of railroad employees. If that class of the community speaks it is likely to be heard in the legislatures more sympathetically than the railroad managements are heard. All it lacks at the moment is organization and this it can learn from the successful experience of labor.

This brings us to the next point.

Whenever any class of society becomes so powerful as in the abuse of its power to affect injuriously the lives, liberty or the pursuit of happiness of or by any other considerable class or classes of society, the consequence, under the existing regime, is for government to lay the heavy hand of regulating authority upon it. This may happen sooner or later, but it is inevitable. Eighteen months ago, in a public address, reasoning from the same premises, I ventured to predict that the public press could not escape such legislation; and we find today an act of Congress regulating newspapers on the statute books. It is not impossible that organized labor may hereafter be faced with a strong and sustained public control of its activities. It would be the logic of the last phase of the present conflict.

III. THE REMEDY: INDUSTRIAL CO-OPERATION.

It is interesting, and perhaps instructive, to think out these things, but it serves little purpose unless it leads to the suggestion of a remedy. We cannot stand still, for "stand pat" policies are not popular at the moment and only serve to prolong the conflict. We cannot revert to the former conditions; the old arguments which convinced men a generation ago may still be listened to respectfully, but they are no longer heeded. We must progress.

The most tragic intellectual life of the last generation was that of the English philosopher, Herbert Spencer. About the middle of the nineteenth century he began the compilation of a synthetic system of philosophy based upon the opinions of that time, and, with extraordinary persistence, learning and intellectual vigor, he labored on, despite physical handicaps, until he completed his self-appointed task in 1896. It was an achievement which, in a previous century, might have had enduring effect upon the opinions of mankind, but while he was writing the world was moving with an increasing velocity, and the opinions which actuated men's political and social life in 1896 were utterly different from those of 1850. His work of a lifetime was out of date before it was complete, and the tragedy is that he saw this. Yet he had the vision of a seer into the future. His last word was a sturdy maintenance of his belief that in 1850 there was reached in England "a degree of individual freedom greater than ever before existed since nations began to be formed," and that this was the highest state to which man could attain, but he had observed the reaction against too much individual liberty and the abuses which it bred, and marked the growing tale of statutes by which the government was given authority to interfere with the daily life of the citizen; in other words, he foresaw the growth of regulation which is now a rooted policy of statesmanship, and he saw that this principle must continue to expand until the government controlled and operated all the industries in which the individual citizen is employed: the only alternative was a compromise, on which the conflicting forces of society, capital and labor, might provide for the continuance of private initiative in industrial opportunity. Dreading socialism, Herbert Spencer found this refuge in Industrial Co-operation.

This economic principle has found many expressions. Under it labor and capital have united in the ownership of a business and have failed. Under it labor has attempted to dispense with invested capital and do business on the aggregate credit of a number of individuals: in what we call merchandizing, and the economists call distribution, as in money lending, success has been accomplished through co-operation, but in the co-operation of production, such as manufacturing, there has been failure for lack of the capital necessary to carry the business over times of stress. Capital itself, represented by conscientious and enlightened men, has from time to time sought to apply the principle of co-operation to industry in the form of profit sharing; here again there has been little real success in accomplishing the prime object, which was an identification of interest between capital and labor, because even the best laid plans of profit sharing have been regarded as a sort of tea table distribution of cake among men who work for bread. The dole is often accepted with a sneer.

I do not now propose any of these forms of co-operation for the railway industry, but one which seeks their object and attempts to avoid the causes of their failure. At the moment, that industry is in a precarious condition, everyone engaged in it has his stake at risk. In order to identify and co-ordinate all the interests involved, and to secure the success which is not only possible but almost inevitable if that result is attained, all must share in the results of the business according to the fluctuation of the industrial barometer: the spur must be the expectation of loss sharing as well as profit sharing.

Specifically, I propose, therefore, that a railway wage schedule shall be prepared as follows:

Calculate on experience what has been the precentage of the total pay roll of all classes of employees to the operating revenue in a given year or average series of years, and apply this percentage to current operating revenues to fix thereby the appropriation for pay of employees. The total appropriation, so made, would then be distributed among the several classes of employees in the percentages of their participation in the pay roll which was taken as the standard, and the individual would share in the appropriation for his class according to his services measured by agreed units.

Under this meter wages would increase automatically as revenues increased, but would decrease automatically as revenues decreased. The prosperity of the individual would be that of the road. Capital, controlling management, would alone be interested in expenses, as now: labor's interest would be in increasing revenue, or what has been heretofore called gross earnings.

While there are many details which would have to be worked out to make this suggestion practically effective, the beneficial consequences of the acceptance of its principle might be far reaching.

The railroad industry would be a united industry; there would be a common interest between employer and employee. The intelligence and energy which are now devoted to the effort, on the one hand, to get wages increased, and, on the other, to resist increases might be expected to be applied to promoting the industry itself. The result would soon be reflected, not only in the income account, but in the statute book. If rates were too low to yield a fair wage to all, as well as a fair return to capital, there would be a united demand for their readjustment which would have the backing of votes as well as argument. The human lust for conflict would find its expression as between railroad and railroad; officer and employee would have a common loyalty, and the healthiest kind of competition would be promoted, that of efficient service. The individual would control his household expenses and would follow the expansion and depression of trade with his own economies: he would indeed be in business, a true unit in the current industrial life of the nation, rather than the beneficiary of the plunder of a successful war.

This is the purpose of Industrial Co-operation.

Is it not worth considering ways and means to bring it about?

TRAIN ACCIDENTS IN OCTOBER.[1]

Following is a list of the most notable train accidents that occurred on railways of the United States in the month of October, 1912:

Collisions.

Date.	Road.	Place.	Kind of Accident.	Kind of Train.	Kil'd.	Inj'd.
7.	Western Md.	Kobeen.	bc.	F. & F.	4	4
18.	Del., L. & W.	Hallstead.	rc.	F. & F.	2	0
19.	Central of Ga.	East Point.	rc.	F. & F.	1	0
21.	Penn.	Williamsport.	xc.	P. & F.	1	2
21.	Gulf, C. & S. F.	Galveston.	bc.	P. & F.	0	15
28.	Southern / Louisville & N.	Knoxville.	xc.	P. & P.	0	7

Derailments.

Date.	Road.	Place.	Cause of Derailm't.	Kind of Train.	Kil'd.	Inj'd.
*1.	Louisville & N.	Athens, Ala.	b. rail	P.	1	17
3.	New York Central	Wende.	acc. obst.	P.	2	3
3.	Fort Worth & D. C.	Amarillo.	unx.	F.	0	4
4.	Southern	Kitchen's.	.....	P.	2	9
†*3.	N. Y., N. H. & H.	Westport.	exc. speed	P.	7	20
8.	N. Y., N. H. & H.	Saybrook.	negligence	F.	1	0
†9.	C. R. I. & P.	Riceville, Ark.	d. switch	P.	2	4
12.	Central Ga.	Hillsboro.	ms.	P.	0	1
12.	Louisville & N.	Cunningham.	unx.	P.	2	12
20.	Norfolk & W.	Cooper.	unx.	P.	1	17
24.	Toledo, St. L. & W.	Fillmore.	.....	Sp'l.	1	6

The trains in collision on the Western Maryland at Kobeen, Md., on the 7th, were a westbound freight of the Reading and

[1]Abbreviations and marks used in Accident List:
rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc.——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——†—Dagger, One or more passengers killed.

an eastbound train of empty passenger cars. Both engines and several cars of both trains were badly damaged. Four trainmen were killed or fatally injured, and four others were injured, one seriously. The collision was due to neglect of the men in charge of the westbound train, who overlooked a despatcher's order.

In the collision near Hallstead, Pa., on the 18th, a conductor and a brakeman were killed. Eastbound extra freight train 755 ran into the rear of a preceding extra freight, No. 745. Both of the men killed were in the caboose. The engineman of No. 755 disregarded block signals, and the flagman of No. 745 was slow in going back. Extra 745 left Binghamton at 4:55 a. m., and extra 755 at 5:02 a. m. No. 745 stopped one mile west of Hallstead at 5:35 a. m., and the engineman claims that he immediately gave a whistle signal for the flagman to go back. The flagman claims to have left the caboose, as soon as the train stopped, with one red and one white lantern, four torpedoes and a red fusee; but when about 75 ft. from the caboose, his red light went out. He returned to the caboose for another red lamp, and was about 250 ft. out on his second attempt, when he saw 755 approaching; and it was too near to be stopped. There was considerable fog. He did not use either torpedo or red fusee; and it is admitted that there was an interval of at least ten minutes between stopping of train and the collision. The engineman admits that by reason of the fog he failed to observe indications of the automatic block signal in the stop position, 2,574 ft. back from the caboose of No. 745.

In the rear collision of freight trains at East Point, Ga., about 4 o'clock on the morning of the 19th, the conductor of the leading train, who was in his caboose, was killed. The second section of train No. 35 ran into the rear of the preceding section in the yard during a dense fog.

The passenger train in collision near Williamsport, Pa., on the morning of the 21st about 4 o'clock, was a southbound express. This train ran into a freight car on a side track which was not clear of the main line. The engineman was killed and two passengers were injured. The collision was due to failure of a brakeman of a switching engine to properly apply brakes on a draft of seven freight cars standing on a running track parallel to the main track, allowing these cars to drift down a grade and to side-wipe some cars being pulled from a siding to the running track. This caused the leading car in the draft of seven, which was a box car, to be pushed over towards the main track just as the passenger train came along, the roof of the box car scraping the entire length of the train.

In the butting collision near Galveston, Tex., on the 21st, four trainmen and 15 passengers were injured. Gulf, Colorado & Santa Fe passenger train No. 3 collided with a switching engine at Fifty-seventh street.

In the collision which occurred at Knoxville, Tenn., on the 28th, a dining car fell off a trestle and was overturned, lodging on the ground about 30 ft. below, and it was subsequently consumed by fire; but only seven persons were injured and none killed. A local passenger train of the Southern Railway ran into a through passenger train, No. 31, of the Louisville & Nashville at the crossing of the two roads near Spring street, the engine of the Southern train striking the dining car of the other. The engineman and fireman of the Southern train and five men in the dining car were the only persons seriously injured. These five men, conductor, cooks and waiters, fell with the car, but were able to crawl out of the openings before the car had taken fire. There was a dense fog at the time of the accident. It is said that the Southern train disregarded a stop signal. This signal consists of a gate standing across the track, not interlocked. Both trains were moving slowly.

The train derailed near Athens, Ala., on the morning of the first, was southbound passenger No. 7. The eight cars of the train fell down a bank where they soon took fire from oil lamps in the baggage cars, and were entirely consumed. An express messenger was killed and 16 passengers and one trainman were injured. The derailment was due to a broken rail.

The train derailed at Westport, Conn., on the 3rd, was westbound passenger No. 53, second section, and the cause was excessive speed—50 or 60 miles an hour—through a No. 10 crossover. Four passengers, one mail clerk, the engineman and fireman were killed and 20 passengers were injured. This accident was reported in the *Railway Age Gazette* of October 11, page 692. In addition to the facts there given it should be noted that between the home signal and the crossover there is a drawbridge, and that the speed rule over this bridge is 30 miles an hour; also that the towerman and a work train conductor, as well as the section foreman, tried in vain to attract the notice of the engineman.

The train derailed at Wende, N. Y., on the 3rd, was an eastbound passenger, on track No. 2. It ran into derailed cars of a westbound freight train which was passing on track No. 3. Two employees were killed and a few passengers were injured. The cars in the freight train jumped the track, from some cause not yet determined, and they fell in the path of the passenger train only a moment before the train came along.

The train derailed near Amarillo, Tex., on the morning of the 3rd, was a southbound local freight. A truck of the caboose was the first to leave the track and the caboose was overturned. Cause of derailment not determined. David Hurley, roadmaster, one of the four men injured, died of pneumonia four days after the wreck.

The train derailed at Kitchens Siding, Ga., on the morning of the 4th, was southbound passenger No. 43, and the engine and first two cars were overturned. The engineman and fireman were killed and two passengers, one trainman and 6 mail clerks were injured. The cause of the derailment was a half-open switch, presumably misplaced with malicious intent.

The derailment at Saybrook Junction, Conn., on the 8th, was due to carelessness in switching. Some freight cars were run against a bumping post at the end of the track so forcibly that they broke over the barrier and crashed into a signal cabin; and the signalman in this building was killed.

The train derailed near Riceville, Ark., on the Rock Island on the 9th, was westbound passenger No. 41. One passenger and the conductor were killed and four passengers were injured. The derailment is believed to have been due to the breaking of a switch rod. A tourist sleeping car ran against a freight car standing on a side track and was badly damaged.

The train derailed at Hillsboro, Ga., on the night of the 12th, was northbound passenger No. 19. The locomotive was overturned at a misplaced switch. The engineman was fatally injured.

The train derailed near Cunningham, Ala., on the 12th, was southbound passenger No. 3. The engine and postal car fell down a bank and were overturned. The engineman and fireman were killed and 10 passengers and two trainmen were injured. An officer of the road writes that the cause of the derailment has not been determined.

The train derailed near Cooper, W. Va., on the 20th, was westbound passenger No. 15. The engineman was killed and 12 passengers, four postal clerks and one employee were injured. None of the passenger cars ran off the track. The derailment seems to have been caused by something dropping from the engine.

The train derailed on the Toledo, St. Louis & Western, near Fillmore, Ill., on the 24th, was a special, carrying officers of the road. The porter on President Ross's private car was killed and six other persons were injured, all of them officers or employees of the road. The cause of the derailment has not been determined. The first truck to leave the track was one of those of the tender. This truck slewed enough to strike a girder of a bridge, knocking down the bridge, and allowing four cars to fall with it.

In a butting collision on the Canadian Pacific at Streetsville, Ont., on the 28th, forty or more members of a militia company were injured, five of them fatally. The collision appears to have been due to a misplaced switch.

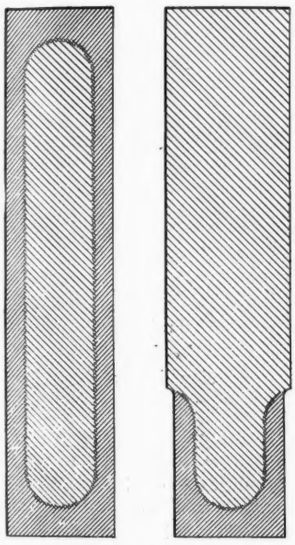
THE PRODUCTION OF SOUND STEEL INGOTS.

By Compressing While the Center Is Still Liquid, Piping and Central Segregation Are Said to Be Prevented.

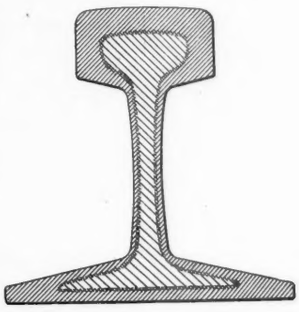
Benjamin Talbot, of the Cargo Fleet Works, Middlesbrough, England, described a new method of getting rid of the pipe and segregation in steel ingots at an informal meeting of the Iron and Steel Division of the American Institute of Mining Engineers, New York, on November 7. The following is an abstract of his paper:

Various reasons have been advanced as to why rails may not be as good in quality today as in the past. Some engineers consider that modern methods of manufacturing, designed chiefly to obtain large output, tend to reduce the standard of excellence of more deliberate methods. Others think that four-ton ingots are worse than those of two tons. Again it is stated that the 100-ton heat in one ladle is too large and is a step in the wrong direction in casting. My experience is that in rolling rails of 85 to 100 lb. sections, the range of ingot is practically only such that the difference in the size does not help in the question of segregation, cavities, or blowholes.

The question of 100-ton ladle heats is an important matter. In my opinion this is distinctly a step in the wrong direction, as it puts a premium on careless and slovenly casting work. We find that in order to empty a 100-ton ladle in the necessary time to prevent skulling, very large nozzles are used, probably as large as 2.5 in. in diameter. The pressure of this large quantity of steel rapidly enlarges the nozzle, and it would be interesting to know what size the nozzle is when the last portion of the heat is poured. Anyway, large nozzles cause heavy washing up the sides of the molds, causing surface defects. There is no doubt that smaller ladle heats, poured with as small a nozzle as the heat will permit, give the most satisfactory results.



Sketches of Ingots Partially and Entirely Reduced in Size by Pre-Rolling.



Section of Rail Rolled from a Pre-Rolled Ingot.

Sound ingots, as regards the elimination of blowholes, are produced by means of the well known powerful deoxidizers, aluminum, silicon and ferro-titanium. All of these deoxidizers have the same effect, when used in the necessarily varying quantities to produce this. They all produce solid steel except for the large central cavity and they all diminish segregation. In my experience I have found with well made steel that an addition of two ounces to the ton of aluminum is equal to 0.25 per cent. of silicon, and to 0.10 per cent. of metallic titanium in the form of ferro-titanium. These additions will all produce the same characteristic central pipe, and if they are used this piped portion should be discarded in each case. If the rails are milled at each end, which gives a bright surface, as is the practice in England, the pipe is disclosed and the rail rejected by the inspectors. The cost of the aluminum addition is very small; with silicon it is considerable, and with ferro-titanium it is large, to obtain the same result.

If it were not for this large cavity, which may affect as much as 33 per cent. of the ingot, the use of these deoxidizers would improve the quality of the finished rail; but owing to this, they are not used to such an extent as to create this. It occurred to me that if we were to use a deoxidizer, such as aluminum, to eliminate blowholes in the outer envelope of the ingot and then reduce the area of the ingot or the top portion, while the center was liquid, the pipe would not form, and a solid mass would be found in the body of the squeezed ingot.

In analyzing and taking sulphur prints off the face of a compressed ingot, which was cut longitudinally through its center, I came across an interesting discovery. I found that whenever an ingot was compressed while its center was liquid, no segregation formed in the center of the upper part as is usual, but that it was driven to the internal face of the solid envelope in a fairly regular percentage over the entire length of the liquid area. The solid outer envelope is the normal steel of the heat and is about 3 in. thick. The carbon in this portion in this case being from 0.65 to 0.70, the carbon in the harder portion next this being from 0.75 to 0.80, and in the center about 0.50. The sulphur and phosphorus also vary in these strata, but as the phosphorus is low in this steel it was not of sufficient amount to be considered.

In ingots compressed while their center is liquid without the use of a deoxidizer, I find that the center shrinkage cavity is not formed, but that the blowholes, which are found in the outer envelope, are not obliterated and can be traced into the rail. For this reason I prefer to use a deoxidizer so as not to have any surface blowholes which tend to give spongy rails.

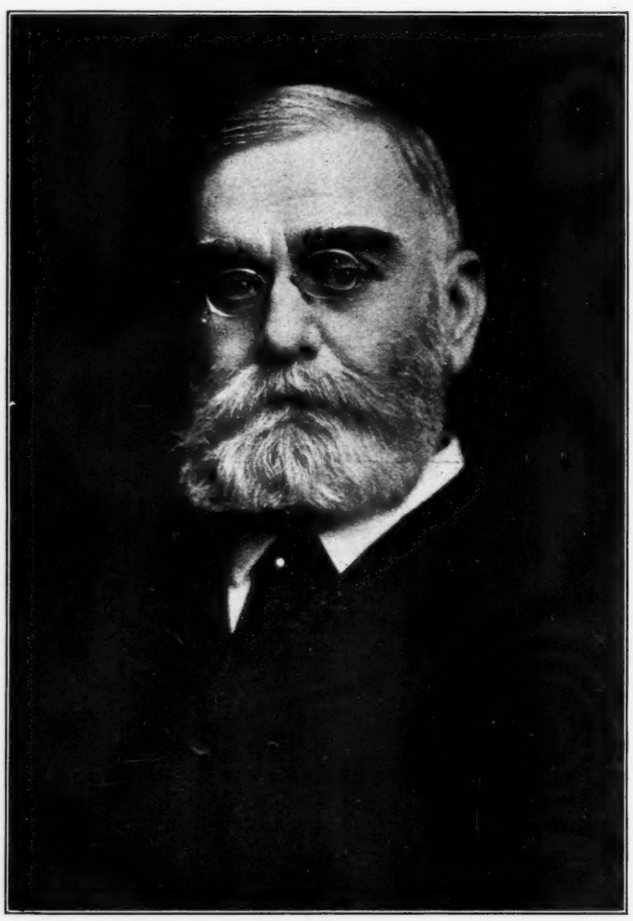
The method of procedure is as follows: An ingot of at least 20 x 24 in. cross section is used, and two ounces of aluminum to the ton of steel are added to the ingot as it is being poured. Aluminum is preferred because of its low cost and its low melting point. It causes a perfectly solid outer envelope to be formed, and solidifies the metal earlier than if no deoxidizer were used. The ingot therefore can be stripped earlier, and it is then put into the soaking pit to allow the envelope to become thicker, and at the same time have a proper temperature upon its surface for compression. A 20 x 24 in. ingot is reduced to about 18 x 18 in., and it is then returned to the soaking-pit for a proper heating and solidifying of the mass. After this has been accomplished, it is rolled down into a bloom, cropped and passed to the rail mill. The rail produced has the same characteristic formation as the squeezed ingot; viz., a hard working face, a harder ring back of this, and a softer center.

It is the question of this new formation that we manufacturers have to discuss with railroad engineers and metallurgists. If they accept this new structure with the guarantee that in this formation they have no pipe in a rail, then it will be for manufacturers to consider laying down the necessary preparatory plant to accomplish the liquid compression of the ingot, as it cannot be properly accomplished in any existing rail mill without largely decreasing the output.

So far the rails produced by this method have been tested under the drop to the British standard specifications and they pass this satisfactorily. The question of taking tensile tests out of the head has still to be considered, as these will vary as they do today, according to the position selected. In fact, small tensile tests are unsatisfactory at the best, and it would appear that the only satisfactory method would be to have the testing machine large enough to pull the full-sized head.

JAMES McCREA.

James McCrea, whose resignation of the presidency of the Pennsylvania Railroad was announced in our last issue, is a descendant of one of the oldest families of Pennsylvania. He was born in Philadelphia May 1, 1848, and bears the name of his first American ancestor, who came to Pennsylvania in 1776 from Londonderry, Ireland, as a representative of large banking interests. James McCrea was educated at the Pennsylvania Polytechnic College, and his railway service began in June, 1865, as rodman and assistant engineer of the Connellsville & Southern Pennsylvania. In December, 1867, he became rodman on the construction of the Wilmington & Reading; in 1868 he was engaged as assistant engineer on the Allegheny Valley, and on March 1, 1871, he entered the service of the Pennsylvania as principal assistant engineer. From that time on, his career is marked by dates which indicate a rapid advancement through nearly all the intermediate positions, from the lowest to the highest. On August 1, 1874, he was appointed assistant engineer of maintenance of way of the Philadelphia Division; January 1, 1875, superintendent of the Middle division; October 15, 1878, superintendent of the New York division.



James McCrea.

On May 1, 1882, Mr. McCrea began his long connection with the Western Lines of the Pennsylvania System, as manager of the Southwest System, with headquarters at Columbus, Ohio. In 1885 he was advanced to the post of general manager of all the Pennsylvania lines west of Pittsburgh; two years later to fourth vice-president; second vice-president March 1, 1890, and first vice-president April 23, 1891.

Mr. McCrea held this position sixteen years, maintaining a close supervision of all the problems of transportation, engineering, finance and traffic; and this was a period of great development. Through his connection with the Pennsylvania lines west of Pittsburgh, Mr. McCrea became president of the Vandalia, the Grand Rapids & Indiana, the Cleveland, Akron & Columbus and a large number of lesser companies.

While residing in Pittsburgh, Mr. McCrea was a trustee of the University of Pennsylvania, succeeding the Hon. John Scott, former United States Senator. This was the first time in the history of the University that a trustee had been chosen who resided outside of the City of Philadelphia, and his election indicated the policy of the University to make its influence coextensive with the boundaries of the Commonwealth.

Mr. McCrea was elected director of the Pennsylvania Railroad in 1899, at the time of the election of Mr. Cassatt as president, and was elected president of the road in January, 1907, following the death of Mr. Cassatt. He was also president of the Philadelphia, Baltimore & Washington; the Northern Central, the West Jersey & Seashore, the Pennsylvania Company, and the Pittsburgh, Cincinnati, Chicago & St. Louis.

Mr. McCrea was the eighth president of the road since its organization in 1847, and was the first since 1852 to resign, with the exception of Thomas A. Scott, who was forced to retire on account of ill health, and who died a few months later from the effects of his arduous service. Mr. McCrea's administration has in a sense been uneventful, because it was largely occupied with an enormous task which had been planned by his predecessor—the completion of the monumental improvement in New York City; and he struck the keynote of his presidential career in a statement made immediately following his election when he said: "The policy of the Pennsylvania Railroad does not depend upon any one man. It continues unchanged from year to year. It will be my purpose to promote as best I can the same progressive development which was conducted so ably under President Cassatt and the presidents who preceded him." Almost his entire work was devoted to the steady conservation and development of the property along the general lines that had been previously followed. That this alone was a task to tax the ablest executive mind is obvious to any one who examines one of the company's annual reports, even superficially. Mr. McCrea was the logical successor to Mr. Cassatt, though the two men differed widely in personality; for their relationship in the management of the great system had been very close. As first vice-president of the Lines West, with headquarters at Pittsburgh, Mr. McCrea had been almost as much the head of a system as was Mr. Cassatt in the East; and in addition to his extended experience as an engineer and an operating executive, he had developed the comprehensive abilities of a financier.

Mr. McCrea strikingly personified the well recognized Pennsylvania policy of conservatism. This has been manifested in his firm attitude in practically refusing to deal with labor organizations. In his testimony before the Interstate Commerce Commission in the rate-advance cases, he presented a forcible and convincing argument for the policy of devoting from earnings an amount equal to dividend payments for the improvement of the property.

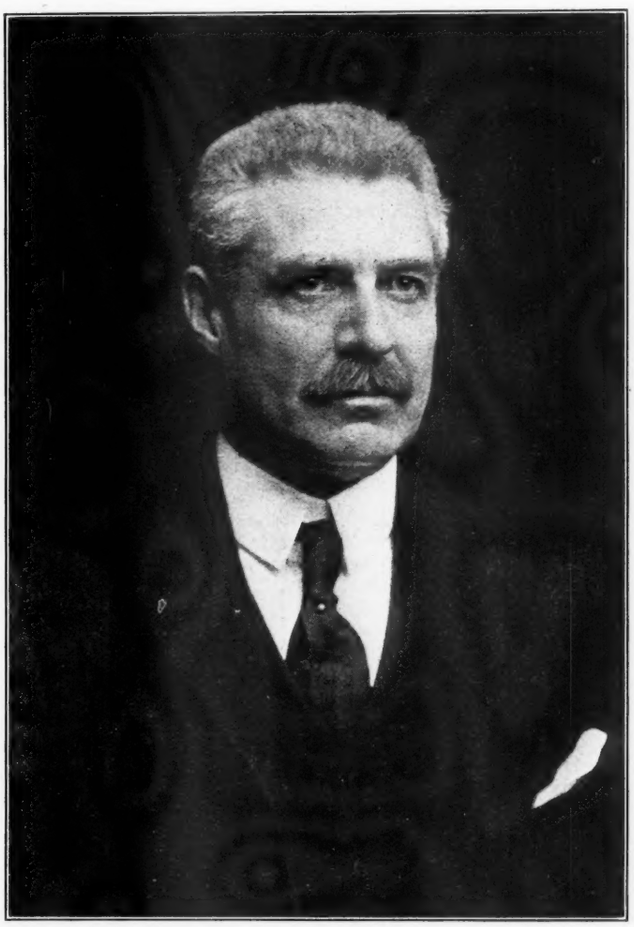
In personality Mr. McCrea is a most impressive man and "looks the part" of a great railway president. Six feet and two inches in height, and built in proportion, with eyes of steel, and a square trimmed bushy beard that fairly bristles at times, those who meet him are at once struck by his forcefulness and energy. While he bears the reputation of never having been interviewed for the press, he has occasionally departed from this rule; and although brusque and at times imperious in manner, he is in fact most approachable and democratic, especially among railroad men of all ranks. And his knowledge of his subordinates is not a mere hand-shaking or nodding acquaintance; while at the head of the Lines West he had a remarkable acquaintance among employees of all classes, and it was said that whenever a place became vacant he always had in mind a good man to fill it.

SAMUEL REA.

Samuel Rea, who was last week chosen president of the Pennsylvania Railroad, was born in Hollidaysburg, Pa., September 21, 1855. His grandfather, John Rea, was an officer in the War of the Revolution, and also in the War of 1812, and was a member of Congress from 1803 to 1811, and from 1813 to 1815. His great-grandfather, Samuel Rea, emigrated to this country from the north of Ireland, 1754-1755.

Mr. Rea was a chainman and rodman on the Morrison's Cove, Williamsburg and Bloomfield branches of the Pennsylvania in 1871. The panic of 1873 stopped all engineering work, and he entered the office of the Hollidaysburg Iron and Nail Company. In 1875 he re-entered the service of the road, and from 1875 to 1877 was assistant engineer in the construction of the chain suspension bridge over the Monongahela river in Pittsburgh. On its completion he was appointed assistant engineer of the Pittsburgh & Lake Erie, where he remained until the completion of that road. In 1879 he returned to the Pennsylvania as assistant engineer in charge of the construction of the extension of the Pittsburgh, Virginia & Charleston.

His next large assignment was the rebuilding of the Western Pennsylvania, to make it a low-grade freight line. In 1883 he was transferred to Philadelphia as assistant to Vice-President DuBarry, with title of principal assistant engineer, which he held until 1888, when he was made assistant to the second vice-president. This office he retained until 1889, when he resigned to go to Baltimore as vice-president of the Maryland Central, and chief engineer of the Baltimore Belt. In 1891, on account of ill health, he resigned and left Baltimore, doing no active work for a year. Then he resumed the practice of his profession.



Samuel Rea.

After an absence of three years from the Pennsylvania, Mr. Rea, in 1892, was chosen assistant to the president of that company. On the day of his appointment he left for London, where, by direction of President Roberts he made an examination of the railways terminating in the English metropolis, and of the underground railways—then constructed and proposed—and he made a special report thereon. The result of this experience was afterward put to good service on the Pennsylvania's New York tunnel extension.

After the death of Vice-President DuBarry in 1892, Mr. Rea was assigned to general construction work then in progress, the acquisition of right of way and real estate in that connection, the promotion of all new lines or branches, and the financial and corporate work incident thereto. In February, 1897, Mr. Rea was appointed first assistant to the president, and in June, 1899, following the election of Mr. Cassatt as president, Mr. Rea was elected fourth vice-president. On October 10, 1905, he was advanced to third vice-president, and on March 24, 1909, to second vice-president. In addition to his former duties he was placed in charge of the engineering and accounting departments. On March 3, 1911, he became first vice-president. (The practice of designating the vice-presidents numerically has now been discontinued.)

Mr. Rea is also vice-president of the Northern Central, the Philadelphia, Baltimore & Washington, and the West Jersey & Seashore, and has been president of many subsidiary companies. For many years he was interested in the project to bridge the Hudson river from Hoboken to New York City, and thus establish in the metropolis a terminus for the railroads using ferries from the New Jersey side. He was one of the incorporators of the North River Bridge Company, chartered by an Act of Congress to build that bridge. But when the other roads failed to join the Pennsylvania in the project to bridge the Hudson, and after a very careful examination and report on the entire project by engineering experts, the Pennsylvania determined to build its own tunnels under the Hudson and East rivers, with a large station in the heart of New York City; and after this plan had been fully approved by President Cassatt and the directors, Mr. Rea was given direct charge of what is looked upon as the most important piece of engineering work in this country; and he has carried it out to a successful conclusion. In recognition of the scope of this great work and of its public utility, the University of Pennsylvania, in February, 1910, conferred on him the degree of Doctor of Science. As a part of this project may be considered the construction of the New York Connecting Railroad jointly by the Pennsylvania and the New York, New Haven & Hartford, which, with the tunnel extension of the Pennsylvania, will form a through railroad route between the Southern, Western and New England States.

Mr. Rea is a member of the American Society of Civil Engineers and of the Institution of Civil Engineers of London. He is the author of "The Railways Terminating in London," a comprehensive study based on laborious personal investigation.

It will be seen that Mr. Rea has been in immediate and responsible connection with new projects, many of them of magnitude, since 1892. The description of the functions performed by him cannot convey an adequate idea of the work in which he was engaged. Mr. Rea's combined responsibility over the civil engineering and accounting departments of a great railroad is, so far as we know, the only instance of its kind. But in addition to these specific duties, it is well known that he has for years been what might be described as the head of the company's diplomatic forces; the ambassador to straighten out complicated negotiations and to tide over grave crises.

From the standpoint of applied ethics, perhaps Mr. Rea's greatest achievement was his resolute stand against the scandalous efforts of a Tammany Hall administration to make a huge profit through the most direct and tangible form of bribery in connection with the New York tunnel extension. We

believe Mr. Rea was responsible, more than any other man, for the courageous attitude taken by the Pennsylvania Railroad in refusing absolutely to trade in that manner. It seems scarcely necessary to say that if all the "big business" of the country had maintained the same moral tone in negotiations with municipalities, the municipalities themselves would be on a far higher plane of government than they are today. Mr. Rea was doubtless embarrassed in this position by the obvious fact that it would have been cheaper for the stockholders to pay tribute than to resist; but his attitude was profoundly justified, and we think nobody could now be found so bold as to maintain that the stockholders were damaged thereby.

A man of the broadest culture and the most intelligent appreciation of the larger aspect of his great profession, Mr. Rea brings to his new office a genius for leadership which has already undergone the most rigid tests, and which seems to us to be peculiarly well adapted to the needs of the great institution of which he is to be the head.

Proposed Line for Uruguay.—An English syndicate is negotiating with the minister of public works concerning the construction of a railway from Montevideo to Artigas, on the northern frontier, where the Yaguaron river empties into Lake Merim. The completion of this road as planned will shorten the journey from Montevideo to Rio de Janeiro, Brazil, to 36 hours.

New Line for Bolivia.—Plans for the construction of a branch railway between Machacamarca and Unica have been completed and accepted by the Bolivian government. This government has also accepted the proposal of a French syndicate for the construction of a railway between Quiaca and Tarija. This line will supply an important link in the railway system of the country, and will place Bolivia in direct communication with Argentina.

New Railroads for Victoria.—The Victorian government program of railroad construction includes 1,624 miles of new lines at an estimated cost of $24,620,000. Of these lines 505 miles are actually under construction, and the remainder are either authorized, recommended, or proposed. The line from Orbost to the New South Wales border is estimated to cost from $3,000,000 to $4,000,000, and other New South Wales connections are included in the list.

Subway and Bridge Costs.—A reinforced concrete highway bridge spanning two railway tracks, waterproofed, paved with vitrified brick and designed for a moving weight of 100 lbs. per sq. ft. of floor area, or a 10-ton road roller, can be built for $1.65 per sq. ft. of floor, including the spans, supports and ordinary foundations, according to a statement made by H. N. Rodenbaugh, assistant engineer, Southern Railway, Atlanta, Ga., in a paper read before the Engineering Association of the South. Such a structure is only slightly higher in first cost than the typical steel girder bridge of similar capacity with a wooden floor, which costs about $1.50 per sq. ft. of floor area complete. A very satisfactory wooden Howe truss bridge of modern design has been built by one railway at a total cost of $.45 per sq. ft. of floor area, and as between the latter two structures Mr. Rodenbaugh very much favors the wooden bridge. Commenting on shallow floors, which are very common in subway design, he states that a typical open floor—that is, one having ties resting on steel stringers without ballast—will have a depth from base of rail to under clearance of about 3 ft. 4 in., and will cost about $1.20 per sq. ft. of floor area. A transverse steel I-beam construction with ballasted deck on flat plates will have for the same span a depth of 3 ft. 1 in., and will cost about $1.90 per sq. ft. of floor area. A transverse steel rectangular trough floor will have a depth of 2 ft. 10 in., and will cost about $2.50 per sq. ft. of floor area. The last two designs are assumed to have waterproofed floors with a minimum of 8 in. of ballast under the ties, the cost given being for the steel work only.

SPECIAL COMMITTEE ON LEGISLATION.

The semi-annual meeting of the railways supporting the Special Committee on Relations of Railway Operation to Legislation was held at the Blackstone Hotel in Chicago on November 20.

The committee reported that 333 roads with a mileage of 217,096 miles are supporting its work. Attention was called to the address of Commissioner C. C. McChord at the Milwaukee Safety Congress in October, in which it was indicated that the investigations of accidents by the Interstate Commerce Commission have confirmed its opinion as to the need of a law for the compulsory use of the block signal system and the use of automatic stops in certain situations, and also for a uniform code of signals and rules, and the committee said that from this it is evident what bills will have the support of the Interstate Commerce Commission in succeeding sessions of Congress.

In an exhibit the committee summarized the numerous bills to regulate operation which have been introduced in the present Congress and indicated that it would be represented before the committees of Congress regarding these bills when occasion requires.

Heretofore, the committee has dealt only with national regulation. In its report it stated that it was providing for state committees to take up the subject of state regulation of operation. On this subject of state regulation the report said:

"During the sessions of the nineteen legislatures meeting in 1912, 292 bills affecting railway operation were introduced and 48 passed. Your committee has arranged to keep itself informed of all bills affecting railway operation introduced and passed in the forty-one states whose legislatures will be in session during 1913. It will continue to keep its supporters advised, as heretofore.

"At the request of three railways having a large mileage east and west of Chicago, your committee undertook to canvass the desirability of creating committees of operating officers to deal with such operating legislation as might be proposed during the sessions of state legislatures convening in January, 1913.

"After the matter had been investigated, a meeting of the railways operating in Ohio, Michigan and practically all states west thereof and west of the Mississippi river was called for October 1, 1912, and at that meeting your chairman was authorized to appoint five railways in each state to act as such a committee, in the following states:

Arkansas,	Michigan,	Oklahoma,
California,	Minnesota,	Oregon,
Colorado,	Missouri,	South Dakota,
Idaho,	Montana,	Utah,
Illinois,	Nebraska,	Washington,
Indiana,	Nevada,	Wisconsin,
Iowa,	North Dakota	Wyoming.
Kansas,	Ohio,	

"It is understood that these committees are entirely independent with regard to all matters committed to them, but your committee has placed its facilities, data and records at their service, in order that the information which has been accumulated may be available in all parts of the country, and that the work done by these state committees may be co-ordinated with the general policy of the railways as developed from time to time by your committee.

"The policy of dealing openly and frankly with legislators is one that has thoroughly justified itself in federal affairs, and it is not unlikely that the same policy in the states may similarly justify itself; at all events, it is clear that effort in this direction should be made."

Cuban Railroad Earnings.—The gross earnings of the Cuban Railroad for the fiscal year ended June 30, 1912, were $3,819,253, as compared with $3,059,650 for the previous fiscal year.

THE ART OF INDUSTRIAL MANAGEMENT.

Abstracts of Majority and Minority Reports of a Committee of the American Society of Mechanical Engineers.

The November issue of the Journal of the American Society of Mechanical Engineers contains the report of the Sub-committee on Administration on the subject of The Present State of the Art of Industrial Management. The majority report, signed by J. M. Dodge, L. P. Alford, D. M. Bates, H. A. Evans, Wilfred Lewis, W. L. Lyall, W. B. Tardy and H. R. Towne, is presented herewith in abstract, as is also a minority report signed by H. H. Vaughan, assistant to the vice-president of the Canadian Pacific.

MAJORITY REPORT.

Within the past 20 or 25 years certain changes have taken place in the attitude of many production managers toward the problems that they face and the forces and means that they control. An increasing amount of attention is being given to the worker. An early evidence was the development of profit-sharing, premium and bonus systems to reward increased effort and output. There followed welfare work, industrial betterment movements, the adoption of safeguards and regulations to minimize industrial accidents, the substitution of the principle of accident compensation for employers' liability and an improvement in the physical surroundings and conditions of factories. All of these tendencies have been fostered and to a great extent initiated by employers. But even today these are by no means generally adopted.

Another tendency, less pronounced in character, has as its object the improvement of the personal relations between employee and employee and between employee and employer. It is an effort to establish the best of factory working conditions in those things not physical in nature, to develop and maintain a shop atmosphere free from all harassing and hindering influences. It is an attempt to make use of the results of experimental psychology, in improving working conditions.

But the most important change and one that comprehends the others is in the mental attitude toward the problems of production. The tendency is toward an attitude of questioning, of research, of careful investigation of everything affecting the problems in hand, of seeking for exact knowledge and then shaping action on the discovered facts. It has developed the use of time study and motion study as instruments for investigation, the planning department as an agency to put into practice the conclusions drawn from the results of research, and methods of wage payment which stimulate co-operation.

REGULATIVE PRINCIPLES OF INDUSTRIAL MANAGEMENT.

The lack of accurate thinking and clear expression in regard to management are nowhere better shown than in many of the statements of the so-called principles. These can be divided into two classes, personal characteristics of managers and mechanical means of applying. It is evident that neither can show us the way in which the activities of industry are to be regulated.

We have pointed out that the underlying principle, that is, cause in the widest sense, the application of which has built up modern industry, is the transference of skill. This basic principle is put into effect on the management side of all industrial activities, through three regulative principles. These have been concisely stated as: (*a*) the systematic use of experience; (*b*) the economic control of effort; (*c*) the promotion of personal effectiveness.

The first includes the use, in all essential detail, of traditional knowledge, personal experience and the results of scientific study on the part of the executive force. It implies the accumulation and use of records and the setting up of standards.

The second includes the division and subsequent co-ordination of both executive and productive labor; the planning of single lines of effort, the setting of definite tasks and the comparison of results; and the effective training of the workers. It implies the previous acquisition of skill by the executives.

The third includes a definite allotment of responsibility and the adequate, stimulative encouragement and reward of both executive and productive labor; the development of contented workers, and the promotion of their physical and mental health. It implies the most thorough comprehension of the human being.

THE PRACTICE OF MANAGEMENT.

As labor-saving management springs from a change in mental attitude, the beginning of its practice should be with the persons having the final responsibility. Before any changes are made, such men should clearly understand the viewpoint from which all of the managerial work is to be done, the principles that are to be applied, the general method of their application and the results expected. A similar mental attitude must be fostered among all the members of the executive force and a period of training for them begun. This may include a redistribution of function and responsibility, and will include a detailed study of production by scientific methods. This is the period of division of thought, training of the management staff and setting-up standards of performance. This must be carefully performed before there can be effective transference of skill to the workers in the production departments.

The usual conception of modern management is that it affects the workmen most of all, tending to stimulate them to turn out increased production to their possible hurt. This is wrong. If the principles outlined are followed, the executive, or non-producing labor is the most affected. Its individuals are compelled to study, plan and direct. They must acquire knowledge and skill in order to transfer it. It is a system of management that forces the executives to manage.

This being so, the introduction of modern management in a plant must be made slowly. The causes of most so-called failures are principally two: a failure of the executives to acquire the vital mental attitude and too great haste in application. The latter seems to be the dominant one. Your committee feels compelled to emphasize the danger of attempting to hurry any change in methods of management. Each step of the work should be made permanent before the next is begun.

After those who are to operate the new methods have acquired the necessary knowledge and established sufficient standards, the work of putting these into effect can be begun. This means the fixing of the best attainable working conditions and giving each worker definite tasks with an adequate reward to each one who attains to the standard set. This part of installing the methods must be accomplished with tact and patience, remembering that leadership and example are powerful aids in bringing about enthusiastic co-operation.

The training of the workers is essential in this part of the application. This must be far more than mere demonstration, the mere showing that a thing can be done. It must be patient teaching and help until the required degree of dexterity or skill is acquired, that is, up to the habit stage. It is evident that such work cannot be hurried.

Such, broadly, are the three steps in the practice of management. It is now necessary to investigate the internal elements of permanence in such methods. If the proper mental attitude is once taken, we believe it will never be given up. This is substantiated by a few cases when early attempts to improve management were failures and the methods abandoned. Later, however, other attempts were made with substantial success. The mental

attitude outlived the failure. Thus in a given industrial organization this feature would not be lost except by a loss of the executive staff.

The permanence of records of performance and standards needs only to be mentioned to be appreciated. Once set up in an industry, disaster is invited if they are disregarded. To these is added a third in the nature of a spur from the working forces to the managing force. An adequate reward is one of the essentials. Whatever disturbs the mechanism of production interferes with the earning of the rewards. The workers at once object, pointing out the trouble and insisting that it be rectified. The management is spurred to keep all conditions up to the fixed standard.

The practice, as outlined, while built upon fixed standards and procedure, is by no means rigid and inflexible as has been alleged. The design and construction of labor-saving machinery is carried on with a multiplicity of different details. Labor-saving management should likewise use a variety of details suited to the requirements of different industries and plants. There can be nothing fixed in such human endeavor except the underlying principle. As a simple matter of fact we have found different methods, details and nomenclature in use in different plants. Many efforts have undergone marked change and development since first installed. Further, this idea of rigidity is repudiated by some of the foremost management experts.

The need of a scientific study of everything connected with production is emphasized. The methods used are adapted from the research laboratory. But the purpose of their use is changed. The scientific investigator uses his laboratory to discover facts. Their discovery and declaration is his end and aim. The management investigator uses laboratory methods to discover facts for immediate use. The end and aim is utility. This is the test of industry. It is therefore unwise and in fact detrimental to carry investigations to an extreme. Enough facts must be observed to shape intelligent action. Persons having time study and motion study in charge should possess that rare, intuitive, human quality that causes its possessor to know when enough observations have been collected to form a sound working conclusion.

The position of the expert in the practice of management is more clearly seen as experience increases. The element of mystery has already departed. This is to be welcomed for it means the downfall of mere "systematizers." One of the unfortunate features of this great movement has been the rise of alleged experts who have been ready to promise extravagant results if they were allowed to systematize an industrial plant. The test which their work cannot meet is the one of permanence.

The real expert concentrates on the facts of a given problem, and from a wide experience in analysis, co-ordination and practical responsibility works out a solution by scientific methods, suited to the material and human factors involved. The tendency is for him to do less of the detail work of installation, but to train and direct the persons who are permanently to manage. This is a true process of transference of skill.

BROAD RESULTS OF LABOR-SAVING MANAGEMENT.

In cases where the use of labor-saving management can be considered a success, the broad results have been: A reduced cost of product; greater promptness in delivery with the ability to set and meet dates of shipment; a greater output per worker per day with increased wages; and an improvement in the contentment of the workers.

These results indicate certain advantages to both employer and employee. But it is charged that the movement has not yet entirely justified itself from the economic view-point, for it has not reduced the cost of product to the consumer. The implication is that its possibilities will not be realized until employers, employees and the public are alike benefited. With this view we are in most hearty accord. Labor-saving machinery has brought the comforts that we all enjoy today. Labor-saving management promises to extend those comforts. Where properly administered it is conserving labor and is thus contributing to the good of society at large, and although the benefit to the consumer may not yet be generally felt, it has already developed to a certain extent and will continue to develop as the natural result of increased production.

MINORITY REPORT BY H. H. VAUGHAN.

I am unable to sign the majority report in its entirety, much as I admire the thoroughness with which it has been prepared and its great interest. In its general tenor it distinctly implies the desirability of what is termed labor-saving management, involving the planning department, functional organization and the bonus system. Perhaps this statement is not strictly justified, but I cannot avoid the impression after reading the report most carefully. That the methods of management have undergone a great change in recent years I certainly agree. I would explain it by stating that in many respects the art of management is developing into a science. In common with most lines of work, the method of investigating facts has changed. Phenomena are analyzed, information is obtained accurately, the mental attitude of the manager is scientific rather than empirical. Things that used to be known generally by gradual experience are now known specifically by detailed observation. In the course of this development many new systems and ideas have been invented, time studies, motion study, payment systems, functional management, etc. Some are new, others partly new, others simply practices of many managers put into definite form. The science of management will classify these for us, perhaps even explain their advantages and limitations so that we may in time know which is preferable and when.

But the introduction of the use of these methods has been attended by claims as to the results that might be obtained by their use, and these claims have led to such absurd statements as that made before the Interstate Commerce Commission, which is referred to in the report. I feel most strongly that each of the suggestions that have been made to improve methods of management may have merit, but I do not feel that any one of them is a panacea for all our inefficiency. For instance, in certain classes of work time studies are valuable, in others they may be a waste of time. In certain classes of work I consider piecework or bonus systems desirable, in others I consider them inferior to day work. Functional management may be an improvement in certain industries, in others I do not consider it suitable. In some cases the workman can be trained by the skilled executive, in others he can train him with ease.

In general I feel that labor-saving management is not any particular system, but will always remain the art of selecting and applying the most appropriate methods furnished by the science of management, the science that records what these methods are and the results obtained from them.

PROPOSED LINE FOR PARAGUAY.—The congress of Paraguay has received a petition for a concession to extend the Concepcion and Horqueta railway to Pedro Juan Caballero and Bella Bista on the Brazilian frontier. The construction of the proposed railway would place Concepcion, the principal port in northern Paraguay, in railway connection with the rich agricultural regions of northern Paraguay and southern Brazil.

NEW LINE PROPOSED FOR NEW SOUTH WALES.—The Public Works Committee has under consideration a project for the construction of a line from Bomaderry, New South Wales, to Captains Point on Jervis Bay. This proposal has been submitted in view of the establishment of a naval college at Captains Point, and the probable opening of Jervis Bay as a port in conjunction with the federal capital. The scheme would cost about $1,349,000, including $340,000 for a new steel single-track bridge over the Shoalhaven river at Nowra. It appears that the line has no commercial possibilities to recommend it, but inasmuch as it would be used in connection with defense purposes, it may be thought worthy of consideration.

SOUTHERN PACIFIC ELECTRIC LOCOMOTIVES.

For Freight and Switching Service—Will Exert Continuously a Tractive Effort of 11,520 Lbs. with Forced Ventilation.

Some time ago the Southern Pacific ordered fifteen 50-ton, electric locomotives to be used for freight and switching service. The first one of these locomotives has just been completed. They are so equipped that they may be operated on either a 600 or 1,200 volt direct current, and if necessary they can be used for passenger service, as well as for freight and switching. The Baldwin Locomotive Works built the mechanical parts at its Philadelphia plant and the Westinghouse Electric & Mfg. Company constructed and installed the electrical equipment at its East Pittsburgh works.

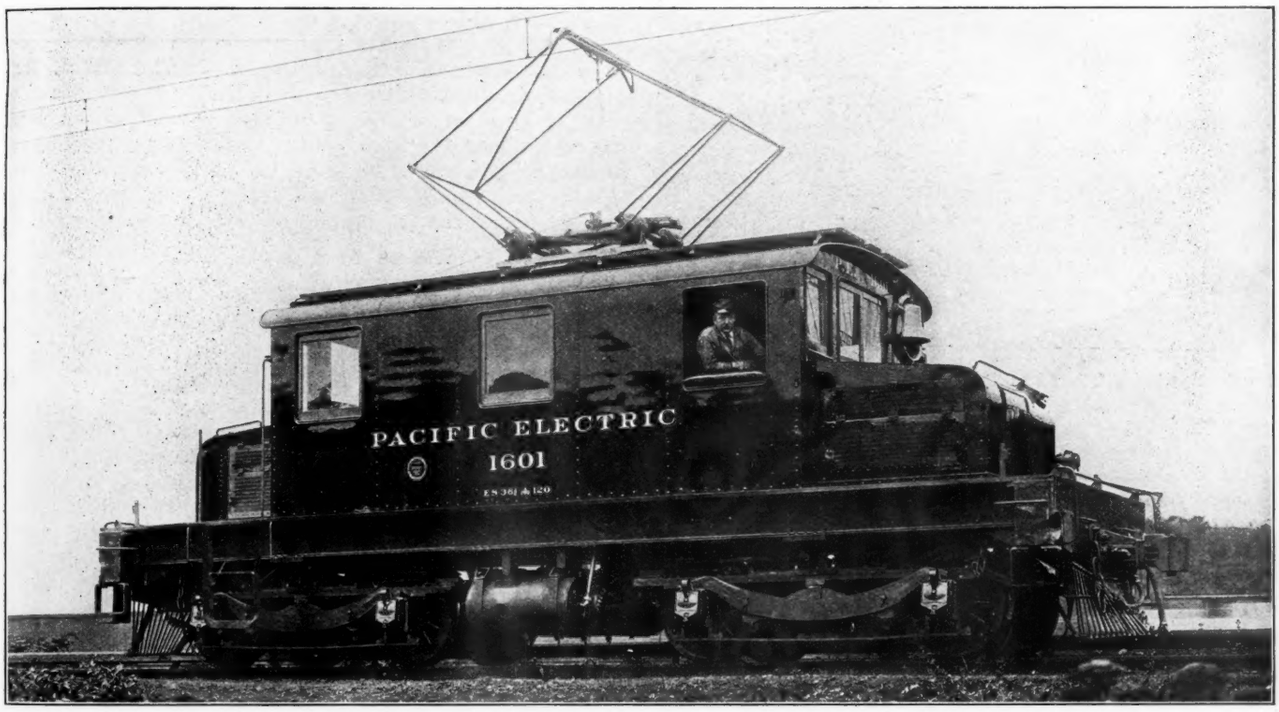
With natural ventilation the motors and auxiliary apparatus on each locomotive have sufficient capacity to enable it to exert continuously a tractive effort of 5,600 lbs. With forced ventilation the locomotive will exert continuously a tractive effort of 11,520 lbs. In one hour, with natural ventilation, the locomotive will exert a tractive effort of 17,200 lbs. at a speed of 18.4 miles an hour, with 600 volts at the motors. With forced ventilation the locomotive can exert for one hour, a tractive effort of 21,600 lbs. at a speed of 17.6 miles an hour with 600 volts at the motors. With clean dry rails, the locomotive can exert a momentary tractive effort of 30,000 lbs.

The frame longitudinal sills consist of four 13-in. channels, each 30 ft. in length. The frame bolsters, to which the center pins are secured, consist of plates 15 in. wide and 1½ in. thick. Above these plates the longitudinal sills are strongly braced transversely by flanged plates, which are riveted to the channels. Further bracing is effected by the cover plates, which are ½ in. thick. The cab floor consists of diamond plating ¼ in. thick, which is laid on the cover plates. The end sills are of cast iron. The couplers are of the short shank, M. C. B. type, with their centers 33½ in. above the rail.

The cab is of steel, and is 18 ft. long and 9 ft. 6 in. wide. It is centrally located, and is arranged for double end operation. At each end is a hood, which is 78½ in. wide. There are side steps at each end of the locomotive, and the cab is entered through end doors, the hood being placed off center to give room for a wide running board on one side. These locomotives are equipped in accordance with trunk line railway practice. The leading dimensions are as follows:

Track gage	4 ft. 8½ in.
Wheel base, rigid	7 ft. 4 in.
Wheel base, total	25 ft.
Driving wheels, diam.....outside, 36½ in.; centers,	31 in.
Journals	5½ in. x 10 in.
Distance between truck centers	17 ft. 8 in.
Width	10 ft.
Height to top of cab	11 ft. 6 in.
Length between couple knuckles	35 ft.
Weight	120,000 lbs.

Four Westinghouse No. 308-D-3 motors drive ten of the locomotives, while three of them are driven by Westinghouse No. 308-B-7 motors. These two motors are exactly alike except that the No. 308-B-3 motor is wound for 1,200 volts, while the No. 308-B-7 is wound for 1,500 volts. Each axle is equipped with an independent geared motor, the motor weight being partially carried by two axle bearings, and the remainder is supported by the nose resting directly on the truck bolster. The No. 308-B-7 motor has the same general characteristics as the 600 volt motor of the same rating, but is insulated for 1,200 volts. Its normal rating with natural ventilation is 225 horsepower at 600 volts with 315 amperes. With forced ventilation, the rating of the motor is 250 horsepower at 600 volts with 350 amperes. Its continuous rating with natural ventilation and perforated covers will be 140 amperes at 300 volts. With forced ventilation the continuous rating is 255 amperes at 350 volts.

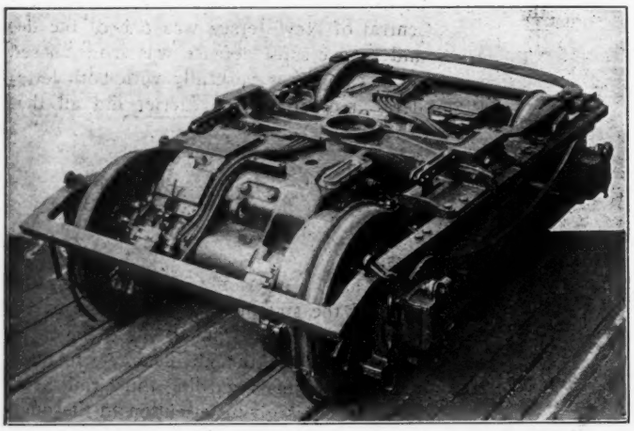


50-Ton Electric Locomotive for the Southern Pacific.

Westinghouse unit switch control, type HL, is used. Three running positions are provided for 600 volts and two for 1,200 volts. To provide the three running positions, a pneumatically operated switch has been installed. This switch can be operated by a control switch from either end of the cab and is so

connected that the two motors comprising each pair may be arranged in series or parallel with each other at the will of the operator. An interlocking arrangement has been provided, rendering it impossible to operate a series parallel switch except when the circuit on the main motor is opened. There are eleven notches on the master controller with the motors in full series, nine notches with the motors in series parallel, and 9 notches with the motors in full parallel.

Two hand-operated drum type switches have been installed in the cab, whereby a change-over from 600 to 1,200 volts can be effected. These change-over switches re-adjust the divisions in the main resistance and connect the two dynamotors for 1,200 volt operation and lock the series parallel switch in series position. The same number of notches are available on the master controller for 1,200 volt operation as under 600 volt operation for full series or series parallel positions. The car-



Truck Used on the Electric Locomotive for the Southern Pacific.

bons and line switches which reverse the master controller are of the standard Westinghouse HL types. Each locomotive is equipped with train line receptacles and jumpers so that any number of engines can be operated in tandem.

In addition to the standard HL control apparatus, a special relay has been provided which will, whenever the trolley passes a specially arranged brush contactor, one of which is mounted on each side of every trolley section insulator, open all the circuits of the motors. This device insures that there can be no current through the motors when the trolley passes the section insulator. To set the relay, and thereby remake the control circuit, it is necessary to first bring the master controller to the "off" position. A warning signal is located in the locomotive cab. It notifies the motorman of any open circuit which may be due to the action of the overload trip, to the blowing of the main fuse, or to the trolley leaving the wire.

The air brake equipment includes two D3L dynamotor driven compressors, each having a capacity of approximately 25 cubic feet of free air per minute. The dynamotors for operating the air compressors were supplied by the Westinghouse Electric & Manufacturing Company. The dynamotor runs constantly while the friction clutch, pneumatically operated and controlled by the main reservoir pressure, will cut in the compressor whenever necessary to maintain a predetermined pressure in the main reservoir. Each dynamotor consists of two sets. The armature and field windings are mounted respectively in the same slots and upon the same poles. When the locomotive is operated on 1,200 volts, the two windings are connected in series, and current for the lights and controller apparatus is tapped midway between the two, providing a voltage of 600 to ground. When operating on 600 volts, one set of the armature and field coils will be cut out and the remaining set will operate as series motors.

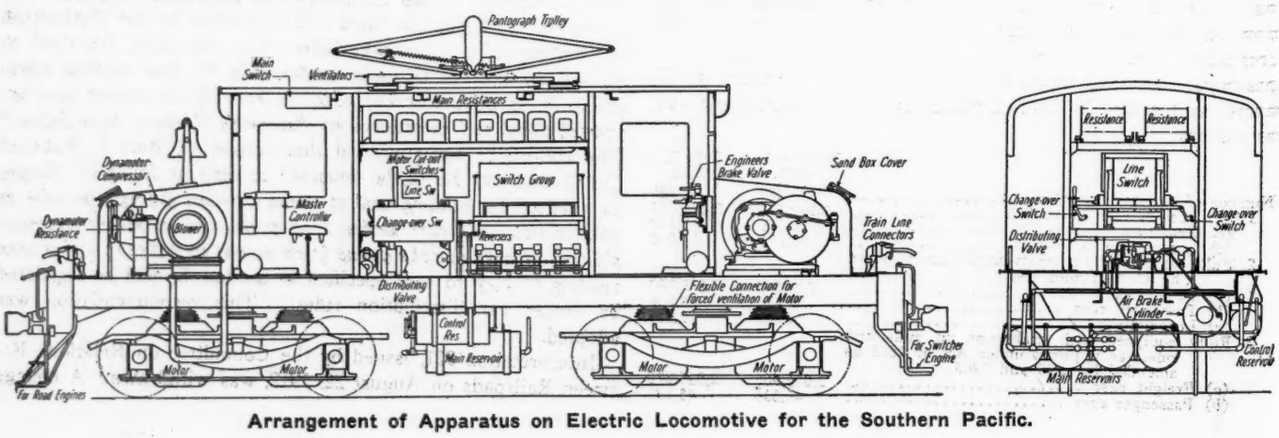
Two fans, for supplying forced ventilation to the main motors, are mounted on the extended shafts of the two dynamotors, and in addition to their function of supplying cooling air serve as light load to limit the speed of the dynamotors when the compressors are not in service.

The trucks are of the equalized pedestal type, with rectangular frames which are forged in one piece. The bolsters are steel castings, rigidly secured to the frame. The pedestals are protected by shoes, which can easily be replaced when worn. The wheels have cast steel centers, with tires held by bolted fastenings. The brakes are inside hung. Westinghouse automatic air brake equipment is applied, and a hand brake is also provided for holding the engine when it is laid up in yards.

NEW TRANSANDINE LINE PROPOSED.—The Chilian congress has under consideration an application for the construction of a new Transandine railway for colonization purposes. The line would be built from Lake Buenos Aires to the Pacific through the Huemules valley.

PARAGUAYAN CONCESSION SOUGHT.—The congress of Paraguay has been petitioned to grant a concession for the construction of a railway to be known as the Southern Railway of Paraguay. The new line will run from Asuncion to Ayolas on the Parana river and will cross the departments of San Lorenzo del Campo Grande, Ita, Yaguaron, Carapegua, Tabapay, or Acahay, Quiindy or Ibicuy, Quiquyo, Villa Florida on the Tebicuari river, San Juan Bautista de las Misiones, and San Ignacio.

NEW LINE FOR PORTUGUESE EAST AFRICA.—The contract for construction of the railway from the port of Beira on the coast of Portuguese East Africa to the Zambesi river has just been signed by a Belgian syndicate and the Portuguese government. It is said that the new line will become one of the principal African railways when its connection with the Shire Highlands Railway at Port Herald, about 210 miles north of Beira, has been accomplished. Construction work will probably be begun in the early part of 1913.



Arrangement of Apparatus on Electric Locomotive for the Southern Pacific.

AMERICAN RAILWAY ASSOCIATION MEETING.

Carbon Steel Specifications Adopted—Car Service and Loading Rules Modified—Larger Standard Box Cars Suggested.

The fall session of the American Railway Association was held at the Blackstone hotel, Chicago, November 20. There were present 180 members represented by 200 delegates. The executive committee reported that the membership now comprises 349 members operating 264,001 miles, an increase of one member and 130 miles. Associate membership now comprises 124 members operating 6,350 miles, an increase of nine members and 332 miles.

The committee on transportation reported the method it has adopted in its investigation to secure information necessary to enable satisfactory work to be done in the revision of the standard code of train rules. The first step was to obtain from the principal members copies of rules in force upon their lines. At the same time a circular was issued requesting suggestions for changes. Copies of codes of rules were received from 182 railroads and suggestions were submitted by 62 members. An experienced man, who has been serving for a number of years as examiner of employees on an important line as to their knowledge of the code of rules, was employed to make careful compilation and comparison of replies showing the exact form of each rule in force on these 182 railroads. After a large number of replies had been received, an auxiliary committee was appointed to make a preliminary examination and report, consisting of H. K. Brady, superintendent, Marietta division, Pennsylvania Lines West; I. H. McEwen, assistant superintendent, New York Central & Hudson River, and Charles Selden, superintendent of telegraph and general inspector of transportation, Baltimore & Ohio. The report of the auxiliary committee is now in the hands of the committee on transportation, and that committee will present a complete report on the revision of train rules to the association as soon as possible.

On the motion of F. A. Delano, the executive committee was instructed to consider a plan to return to the former practice of having the association indicate when the summer and winter time-tables should go into effect.

The committee on maintenance reported that the tests of steel rails, being made by M. H. Wickhorst, under the special direction of the rail committee of the American Railway Engineering Association and the auspices of this committee, have been continued, but are not finished. The committee recommended that specifications for carbon steel, included in report No. 30 of the engineering association, be provisionally approved as standards of the American Railway Association. This recommendation was adopted. The committee presented a report from its subcommittee on standard dimensions of box cars favoring the cooperation of the mechanical, engineering and traffic officers to design a new standard box car. The report was referred back to the committee for further consideration. A box car 40 ft. 6 in. long, 8 ft. 6 in. wide and 9 ft. high, inside measurements, was believed by the sub-committee to be the largest that can now be handled with reasonable facility on main lines. The committee included in its report a summary of the freight cars, passenger cars and locomotives equipped with standard appliances, as required by United States safety appliance standards, as follows:

	January 1, 1912.	July 1, 1912.
Number of members reporting	287	286
1. (*a*) Freight cars in service	2,048,267	2,026,843
(*b*) Passenger cars in service	46,455	45,192
(*c*) Locomotives in service	53,072	54,092
2. Fully equipped with safety appliances required by U. S. Standards:		
(*a*) Freight cars	119,540	235,709
(*b*) Passenger cars	9,478	16,708
(*c*) Locomotives	14,391	30,563
3. Fully equipped with grab-irons on ends and sides, as required under Act of 1893 as amended in 1896 and 1903:		
(*a*) Freight cars	2,046,906	2,026,670
(*b*) Passenger cars	46,336	45,181

The association adopted a standard form for reporting locations of freight cars to the Interstate Commerce Commission so that it can tell what the car situation is, as between railways.

The committee on explosives reported that encouraging progress is being made by the roads, that are members of the bureau of explosives. The committee attributed this improvement to an increase in active interest in this work by railway officials and to the growing practice of having one or more clerical employees of each line designated to receive special instructions from the chief inspector and then to look after the inspection reports of local inspectors. The committee referred to the decision relating to the transportation of explosives in a suit for damages caused by the explosion at Communipaw, N. J., February 1, 1911. The Central of New Jersey was one of the defendants in the suit, and a successful defense was made, based largely on the fact that in complying faithfully with both letter and spirit of the federal regulations the carrier did all that reasonably could be expected.

The committee on electrical working presented a progress report. No important comments have been received regarding the report, submitted last May, covering the recommended standard for limiting clearance lines and rolling equipment and specifications for overhead crossings of electric light and power lines. Pending comments by various railroads on the recommendations contained in that report and the statement in the report of the committee on maintenance on maximum dimensions of box cars and right of way clearances, it is not thought desirable to make further recommendations at this time regarding third rail clearances. Meanwhile the committee is giving attention to the question of location of overhead working conductors which are required for alternating current electric traction, and expects to submit a report thereon at the spring meeting.

The committee on relations between railroads presented an amendment to Per Diem Rule 1, providing a penalty of five cents a day when the per diem is not reported to car owners within six months. The proposed amendment is to be submitted to letter ballot. The committee also presented an amended form of interchange report to be used in connection with cut-up forms of interchange blank as approved by the Association of Transportation and Car Accounting Officers. On recommendation of the committee the amended form was adopted. The committee presented amended forms of car service rules 10 and 11, which were approved. On recommendation of the committee resolutions in regard to marking of cars and standard location for such marking were adopted. These provide that the recommended practice of the Master Car Builders' Association on this subject be strictly observed. In re-lettering old cars, marks should be placed in the standard location regardless of the old location of marks. In connection with car service rule 15, paragraph D, on recommendation of the committee the association resolved that "railways must publish third rail clearances in the Publication on Railway Line Clearances before they can claim the right to charge the cost of transfer, under rule 15, first section, paragraph D, to the delivering road, on cars which cannot pass approved third rail clearances of American Railway Association." The committee recommended that section B, Rule 1, National Car Demurrage Rules, be amended to read as follows: Empty cars placed for loading coal at mines or mine sidings, or coke at coke ovens, *and cars under load with coal at mines or mine sidings, or coke at coke ovens* (new words in italics); and a note reading "Delay to cars specified in section B, will be regulated by proper car distribution rules." This recommendation was adopted.

Interpretation 921, issued by the Committee on Relations Between Railroads on August 22, 1912, was withdrawn. A change

in section A of rule 9 of the National car demurrage rules was approved so that it will now read: When a shipper or receiver enters into the following agreement, the charge for detention to cars, provided for by Rule 7, on all cars held for loading or unloading by such shipper or receiver shall be computed on the basis of the average time of detention to all such cars released during each calendar month, such average detention to be computed as follows: A credit of one day will be allowed for each car released within the first 24 hours of free time, except for a car subject to Rule 2, Section B, Paragraph 5. A debit of one day will be charged for each 24 hours or fraction thereof that a car is detained beyond the free time. In no case shall more than one day's credit be allowed on any one car, and in no case shall more than five days' credit be applied in cancellation of debits accruing on any one car. When a car has accrued five debits, the charge provided for by Rule 7 will be made for all subsequent detention, including Sundays and holidays.

At the last meeting (May) the association instructed a committee to investigate the subject of handling cars loaded with company material and to report thereon. The committee concludes that it is not desirable to make any attempt to adopt in detail any standard practice for the prompt handling of company material. The committee, however, adopted the following resolution which was approved by the association: Resolved, that during periods of car shortage each company shall obtain reports to show how promptly it is releasing the revenue equipment used in handling its own material, with the object of expediting the release of such equipment.

The committee reported that the question of uniform size for annual and trip passes was referred to it for recommendation. After the investigation it recommended the adoption of the following uniform sizes by all railroads. This was approved by the association: The standard size of card passes to be 2½ in. x 3 15/16 in., round corners; trip passes 3 in. x 11 in., to include stub going and return portions, subdivided as may be desired, preferably 3 in. stub, 3 in. going coupon, and 5 in. return coupon.

On recommendation of the committee, resolutions respecting the preparation of cars for loading L. C. L. freight and also the preparation of cars to prevent grain leakage were adopted. These provide that cars be cleaned and that nails and spikes protruding from the floor, sides, ends and door posts be withdrawn or driven in; all heavy forwarding and transfer stations should be kept supplied with the necessary equipment of brooms, wheelbarrows, hatchets and nailpullers in order that these instructions may be complied with literally; also that box cars used for bulk grain loading be carefully inspected to insure against grain leakage defects, and that where advisable to do so, burlap or Kraft paper for temporary protection against minor grain leakage be used. The committee offered and the association adopted resolutions providing that members of the association be requested to send monthly to the general secretary, copies of reports now made to their managements, showing amount expended for loss and damage to freight, for compilation by the sub-committee on packing, marking and handling of freight. The committee presented a compilation, made under its direction, respecting freight cars owned, cost and maintenance for the year ending December 31, 1911.

The New York Central, Norfolk & Western and Pennsylvania railroads were elected members of the committee on safe transportation of explosives and other dangerous articles. The New York Central, the New York, New Haven & Hartford and the Southern Pacific were elected members of the committee on electrical working. D. L. Bush, general manager, Chicago Milwaukee & St. Paul, and C. W. Galloway, general manager, Baltimore & Ohio, were elected members of the committee on nominations. The association decided to hold the next meeting in New York, May 21, 1913.

New Railroads for Brazil.—A German syndicate has received a concession for the construction of a railroad across the Agrapehy-Peixe valley to the Parana river.

General News.

The Interstate Commerce Commission has asked the Special Committee on Relations of Railway Operation to Legislation to take some action with reference to derailments at crossovers, such as recently have taken place on several railways. The special committee now has this matter under consideration.

The Philadelphia & Reading, following the Pennsylvania, the New York Central, and a number of other roads, has decided to use lamps for tail end markers on trains in the day time as well as at night, displacing green flags. The order says that in snow and sleet storms the lamps should be kept burning to prevent snow and ice from obscuring them.

The Transcontinental Railway Commission has begun running trains over the new line between Moncton, N. B., and Edmundston, 230 miles. Trains will be run each way three times a week. This arrangement is made for the temporary accommodation of the people, pending the time when the Grand Trunk Pacific shall have taken a lease of the line under the terms of the national transcontinental railway act.

In a butting collision of passenger trains on the Seaboard Air Line near Norlina, N. C., on Tuesday morning last, eight persons were reported killed; both enginemen, both firemen, a porter, two express messengers and two employees, off duty, riding on one of the trains. The trains were No. 81, southbound, and No. 84, northbound. The reports say that the engineman of the northbound train probably misread a meeting order.

Fairfax Harrison, president of the Chicago, Indianapolis & Louisville, has issued a statement saying that beginning November 24, thirty minutes will be added to the schedule of the fast passenger trains of that road between Indianapolis and Chicago. The change is explained in part as follows: "This schedule will be in force during the winter months, and is made in the interest of safety of the public during the season when the ordinary risks of railway operation are at their maximum. The new schedule has been approved by the railway commission of Indiana."

Thomas P. Fowler, who recently retired from the presidency of the New York, Ontario & Western, has been presented by the employees of the operating department of the road with a beautiful silver loving cup. Representatives of the different classes of employees visited Mr. Fowler at his home in Warwick Valley, by a special train, and the presentation was made by Edward McNiff, who has been an engineman on the road since 1876. Other members of the committee represented the conductors, the brakemen, the firemen, the mechanical department, the station agents and telegraphers and the roadway department.

Relations between the New York Central Lines and the O'Gara Coal Company of Chicago are being investigated by the federal grand jury at Chicago. It is understood that the investigation is based on information furnished by the Interstate Commerce Commission, which was the subject of a hearing before Commissioner Harlan recently, when officers of the Lake Shore & Michigan Southern were questioned about a payment of $60,000 to the coal company, which was not satisfactorily explained. In previous hearings before the commission in its investigations of the relation between railways and coal companies it had been shown that many officers of the New York Central Lines formerly held stock and bonds in the O'Gara Coal Company.

Five investigations have been ordered of the collision on the Cincinnati, Hamilton & Dayton at Irvington, Ind., reported in last week's issue, in which a passenger train ran through an open switch and struck a freight train standing on a siding. The Indiana Railroad Commission will hold a hearing November 25. Two inspectors of the Interstate Commerce Commission have been inquiring into the cause of the accident. Judge Markey of the criminal court has instructed the Marion county grand jury to make a thorough inquiry and return indictments if it is found that any person was guilty of criminal negligence, the coroner has examined witnesses and the railway company has made an investigation. The Indiana commission has given out a copy of an order which was issued by it last May, requiring the road to equip its line between Glenwood, Ind., and the Ohio state line with automatic block signals by January 1, 1913.

Centralization of Downtown Terminals in Chicago.

A plan for rearranging the downtown terminals of the various railways in Chicago was exploited before the Illinois Manufacturers' Association on last Monday, by Jarvis Hunt, a Chicago architect. The plan contemplates the straightening of the Chicago river from Van Buren street to Twentieth street, the new channel being located 175 ft. east of Canal street, and provides for a large freight and passenger terminal between Twelfth and Eighteenth streets and State street and the relocated river. Passenger trains from all roads would come into this station, pass around a loop and depart over the route on which they had entered. Passenger trains would be brought into the station on elevated tracks, while street traffic would move at the surface level. Incoming freight would enter on an elevated level and outgoing freight on a depressed level.

Plans were also shown for development of freight house facilities by the building of a number of new freight houses in this same area to accommodate traffic from the different sides of the city. The advantages claimed for this were the bringing of much land now west of the river, east of it, thereby increasing its value materially, the opening of a number of new north and south streets from the business district and the concentrating of railway terminals. Those in favor of the plan rely upon the fact that the property affected is now practically all owned by the different railways to assist in securing its favorable consideration.

Wrecks on the New Haven Road.

On Saturday morning, November 16, a westbound express train was derailed on the New York, New Haven & Hartford, at Milford, Conn., while running at full speed, and four cars were lodged on the ballast so near the adjacent main track that a few minutes afterwards they were badly damaged by a freight train running in the same direction which tore out some of the side sheathing and side frames of the passenger cars.

On the evening of the same day the "Merchants' Limited," westbound, was derailed at Green's Farms, Conn., while running at about 50 or 60 miles an hour and 17 passengers were injured; though the statement issued by the railroad said that only one of the 17 was hurt so badly that he had to go to the hospital. In the Milford derailment no persons were seriously injured.

On the same day that these accidents were reported the coroner came out with his findings on the derailment which occurred at Westport, October, 3, and the three occurrences were used by the sensational press as texts for long accounts of the alleged mismanagement of the road. These accounts dwelt principally on alleged defects in the tracks, though in only one case, that at Milford, did a fault of the track figure in the cause; and this fault was one which even the yellow journals would have difficulty in using to support a charge of "mismanagement."

The cause of the Milford derailment, according to a statement issued by the railroad company, was the breaking of a plate under the wing rail of a frog leading to a siding. At Green's Farms the cause was the dropping of an equalizer bar on the track from the truck of the dining car, the third car in the train. This bar was dragged along to a trailing switch where it derailed the four rear cars. At both of these places the track was in good and normal condition. At Milford many of the ties are creosoted and the track is laid with tieplates; and the rails are fastened with screw spikes.

The coroner, in his report on the Westport derailment holds the engineman criminally negligent; and he charges the railroad company with "concurrent responsibility" because it had not installed a No. 20 crossover after the experience of the Bridgeport wreck in July, 1911. He says that the fire extinguishers in the cars were insufficient and that there should have been more trainmen to operate the extinguishers. He says that fire extinguishers should be so simple that any passenger could operate them without reading the instructions; that the railroad company should be required to introduce steel cars "as speedily as is consistent with proper construction"; that approach locking should be applied at the switches; that passenger trains about to run through short crossovers should be brought to a full stop, and that automatic train stops or cab signals should be installed "when and as approved by the Public Utilities Commission."

On Sunday, November 17, there was a rear collision of freight trains on the New Haven road at Putnam, Conn., and one man was killed. On Monday, the Interstate Commerce Commission announced at Washington that Assistant Secretary George B. McGinty and Inspectors Howard, Swazy and Hawley had been sent to Green's Farms, and three other inspectors to Putnam.

On the same day, R. T. Higgins, of the Connecticut Public Utilities Commission, and C. C. Elwell, engineer of that commission, went to Washington to confer with the Interstate Commerce Commission.

Electrification of the Rio Grande.

Vice-president E. L. Brown, of the Denver & Rio Grande, on returning from New York City, November 17, announced that the company will at once take steps to electrify important sections of that company's road. The first unit to be electrified will be the line from Helper, Utah, to Salt Lake City, 114 miles. The second unit will be over Tennessee Pass—the great continental divide—in Colorado, and will involve the electrification of the line from Salida, Colo., to Minturn, 87 miles. The work in Utah will be begun early in 1913, and it is hoped that it will be finished by the time the new 2 per cent. detour line over Soldier Summit is ready for use, which probably will be in July. In Utah the power is to be furnished by the Utah Utilities Company; and for the lines in Colorado it is expected that it will be furnished by the Central Colorado Power Company. The improvements to be undertaken by the three companies, the Denver & Rio Grande, the Utah Utilities Company and the Colorado Power Company will aggregate in cost between twenty and twenty-five million dollars; and most of this sum will be expended during 1913 and 1914. The plans contemplate the addition from time to time of other sections, so that eventually the entire Denver & Rio Grande system will be operated by electricity. This power is all to come from the vast torrents now coursing down the sides of the mountains only waiting to be harnessed.

Report of Board of Inquiry on Montz Collision.

The board of inquiry convened at New Orleans on November 13, for the purpose of determining the cause of and responsibility for the rear collision at Montz, La., on the Yazoo & Mississippi on Monday, November 11, when 13 passengers were killed, has submitted its report. Flagman M. H. Cunningham of the passenger train is principally blamed for the accident. An account of the accident was published in last week's issue.

The report says that the excursion train, consisting of two locomotives, a baggage car and nine coaches had proceeded to a point about two miles south of Montz, where it was stopped on account of an eccentric blade dropping under one of the locomotives. While standing, the passenger was struck by a following freight train, consisting of one locomotive, ten cars and a caboose, all equipped with air brakes in working order. The crew of the excursion train had the necessary signals to protect their train, and at least thirty minutes had elapsed between the time it came to a stop and the time it was struck.

From Flagman Cunningham's own testimony and the corroborative testimony of other employees concerned in the accident, it is definitely determined, the report says, that he failed to carry out the provisions of Rule 99 in the following particulars:

"Although admitting he had three torpedoes with him, he did not place two torpedoes on the rail, two lengths apart, one-half mile to the rear of his train, and did not leave one torpedo one-fourth of mile to rear, consequently utterly failed to give warning to engineer of train 58 in this manner.

"He did not light and display a red fusee upon seeing or hearing approaching train.

"He did not proceed a sufficient distance to the rear of his train in accordance with the rule, nor as far as the circumstances of the stop, which were apparent to him, obviously required.

"In answer to direct questions Flagman Cunningham admitted that he did not go back the distance required by the rules, admitted he failed to place torpedoes and burn red fusee in accordance with the rules, and admitted that, if he had complied with the rules the collision would not have occurred."

In view of the foregoing the board finds "that Flagman M. H. Cunningham was grossly negligent in not protecting his train in accordance with the rules, which are definite and explicit, and of which it was shown he had a good knowledge and understanding"; that Conductor W. D. Stinson of the excursion train, "while he saw that the flagman went back, was derelict in his duties, in that he had not assured himself that the flagman was at his proper post and had taken the necessary precautions"; that Assistant Trainmaster B. W. McBurney, who had been in-

structed to accompany the excursion train, "is subject to censure in that he did not assure himself that the conductor was performing his duty." The report states that the engine was so disabled that to move it would have been at the risk of derailing it, and therefore the engineman was correct in not attempting to pull the train to a siding or beyond the spot where the collision took place.

In regard to reports that the railway company did not afford the prompt relief to the injured and information to the public that can be expected on such occasions, the board finds from the testimony that such was not the case; that as quickly as possible after the accident occurred relief trains from Baton Rouge and New Orleans were run to the scene with surgeons, and information was given to the public as quickly as it was obtained. The report is signed by W. L. Park, vice-president and general manager of the Yazoo & Mississippi Valley; Charles Godchaux, president Whitney Central Bank, New Orleans; Ernest Lee Jahneke, president Jahneke Navigation Company, New Orleans; A. S. Baldwin, chief engineer Y. & M. V.; and S. S. Morris, general superintendent Y. & M. V.

The Louisiana railroad commission, after an investigation at which a large number of witnesses were examined, has submitted a report containing the following conclusions:

That the flagman is primarily responsible for the accident by not going back the required distance and by not lighting a red fusee.

That conductor contributed to the wreck by his failure to obey the rules of the company by not going to the rear end of his train to see that the flagman had performed his duty after he ascertained the cause of the stop.

That the assistant trainmaster utterly failed to perform the duties incumbent upon him as an official, and to which he had been specially assigned on this occasion.

That the company is lax in the enforcement of the rules; that it was careless in the selection of the equipment to be used on the excursion train; that its system of selecting its employees and training them for their work is not as rigid as it should be. . . .

The commission also finds that an improvement in the system of protecting trains is necessary and recommends the installation of block signals.

Southern Pacific Employees' Clubs.

The Southern Pacific and the allied lines of the Harriman group have for six years carried on a systematic, startlingly effective war against the saloon—the railroader's worst foe. Besides the strict enforcement of Rule G, prohibiting the use of intoxicants on or off duty, the companies have built sixteen club-houses for the employees at operating centers. Neat rooms, well-cooked, wholesome food of the best quality, non-intoxicating drinks, cigars, candy, and tobacco were provided for the men in these club-houses. Billiard and pool tables, bowling alleys, libraries, shower-baths, lounging places, halls for dances and meetings, were placed at their disposal. Almost from the beginning these club-houses became extremely popular, and proved to be powerful factors in enforcing Rule G, effective competitors of the saloon. In one small railway town of three thousand souls twenty-nine saloons flourished when the club-house was opened. Six months later half a dozen drinking places closed their doors. The others showed fight. Club-house employees were bribed to give poor service, cooks were induced to poison the men's food; as a last resort, the entire club-house crew was bought to go on strike. But the saloons lost. Two years after the opening of the club only seven of the original twenty-nine bars were left. Twenty-two closed for lack of patronage. At Tucson the floor of the club-house had to be relaid four times in six years. At Green River, a Wyoming division point so desolate and dreary that few workers remained after the first pay-day, the club-house lengthened the average term of service from less than thirty to more than ninety days. Everywhere the superintendents reported greater efficiency, sobriety, and self-respect among club-house patrons. Undoubtedly the clubs' influence upon the human factor assisted materially in bringing about the record of four years' safe travel, lately noticed in the newspapers. The victories won in the fight against the saloon by the institution have been permanent and progressive, thanks to the novel principles upon which the management of the club-houses is based. F. G. Athearn, the social engineer who founded the clubs, acted on the theory that institutions similar to the Young Men's Christian Associations would not reach the class of men he dealt with. Departing from the accepted standards of social welfare work, Mr. Athearn studied the methods of the enemy, the saloon, and adapted them to the railway's purposes. The saloon requires neither dues nor membership cards from its patrons. Neither do the railway clubs. They are open day and night to every employee who wishes to make use of their facilities. As in the saloon, all club patrons stand upon a plane of social equality—the same courtesy that greets the aristocratic engineer or conductor is extended to the humble section worker. Like the home and the saloon, the walls of the club-houses are innocent of signs prohibiting swearing, smoking, expectorating. There are no rules of conduct. The men's freedom of movement and action is as unrestricted as it is in the saloon. But the subtle influence of wholesome, neat environment has in no instance failed to prevent abuses. The men are expected to behave as gentlemen—and they do. They pay their way just as they do in the saloon, though no profit is derived from the operation of the club-houses except the indirect benefit resulting from cleaner, stronger, healthier manhood. This enterprise has vigorously suppressed every tinge of paternalism and patronage in order to lay hands upon that most elusive, unwilling individual, the adult, independent, self-respecting worker, and keep him out of the danger zone of the saloon.—*The Outlook.*

The Grand Trunk in Southern New England.

Suspension of work on the Grand Trunk's new line to Providence, R. I., was noticed last week, page 958. President E. J. Chamberlin is quoted in substance as follows:

The suspension of work was a part of a general curtailment of construction work along the whole of the Grand Trunk system. Upon the general resumption of construction work, so far as he knows there will be no discrimination made in regard to work on the Southern New England.

Conferences with the New Haven road have not touched the matter of the abandonment of the Palmer extension, nor the question of reimbursement by the New Haven for any expenses already incurred in the construction of the Palmer extension. The appropriations by the state of Rhode Island and the city of Providence for harbor improvements were made, not for the benefit of the Southern New England, but for the benefit of themselves.

The draft of a traffic agreement which has been discussed by the Grand Trunk Railway and the New York, New Haven & Hartford is understood to provide for a twenty-five year period. It is said to leave the G. T. free as regards completion of the Southern New England the terminal facilities at Providence and the Long Island Sound boat lines. It provides for the closest relations for interchange of traffic, joint use of tracks and stations, joint rates, and joint operation, both in relation to New England cities and New York City. The C. P. will have the same privileges as the G. T.

Among the things done by the governor of Rhode Island and his representatives to protect their state against the supposed aggressions of the railways was to make a complaint to the Attorney-General at Washington, and, according to the newspapers, Mr. Wickersham ordered the facts to be investigated with a view to determining whether he ought to prosecute the two railroad companies for violating the anti-trust law. The Attorney-General of Rhode Island also intends to lay the complaint before the committee of Congress which is investigating the "money trust."

On Wednesday it was announced that Attorney General Wickersham had begun a grand jury investigation at New York, sending subpoenas to numerous directors; but that he had suspended it, before taking any testimony, evidently finding his information less promising for a prosecution than at first appeared. The presidents of both roads offered to give him any and all facts. On the same day Mr. Mellen said that he had sent to the Grand Trunk a draft of a proposed traffic agreement.

American Association of Freight Traffic Officers.

The annual meeting of the American Association of Freight Traffic Officers was held at Chicago on November 15. Officers were elected for the ensuing year as follows: President, W. B. Groseclose, assistant freight traffic manager, Missouri, Kansas & Texas, Chicago, Ill.; first vice-president, Brent Arnold, general freight agent, Louisville & Nashville, Cincinnati, Ohio; second

vice-president, L. E. Chalenor, general freight agent, Seaboard Air Line, Norfolk, Va.; third vice-president, Paul Wadsworth, freight traffic manager, Delaware & Hudson Co., Albany, N. Y., fourth vice-president, G. A. Blair, general traffic manager, Chicago & Alton, Chicago, Ill.; secretary-treasurer, E. B. Crosley, general coal freight agent, Philadelphia & Reading, Philadelphia, Pa.; executive committee for two years, Jas. Menzies, freight traffic manager, Atlantic Coast Line, Savannah, Ga.; E. D. Hotchkiss, general freight agent, Chesapeake & Ohio, Richmond, Va.; F. C. Reilly, assistant freight traffic manager, St. Louis & San Francisco, St. Louis, Mo.; W. R. Powe, member Committee on Uniform Classification, Chicago, Ill.; W. S. Howell, assistant general freight agent, Chicago, Milwaukee & St. Paul, Chicago, Ill.; to complete term, D. L. Gray, assistant freight traffic manager, Erie, New York, N. Y. At the annual banquet in the evening addresses were made by W. L. Ross, president Toledo, St. Louis & Western, W. H. Manss, William Ellis and W. D. Nesbit. In the course of his address, Mr. Ross said:

"We all believe in railroad regulation, but it should work both ways. It should protect the men whose business depends upon the railway from injustice or imposition. But the real regulation to which we are looking forward will also protect the railways from other classes. The politicians who have been the principal railroad regulators in the past, have been helped by many honest law makers who really thought they were working in the interests of the public.

"This country is growing steadily and constantly. Its business needs the continued development and extension of its transportation facilities. The increase of these facilities is today of far more interest to the commercial interests of the country than any reduction of rates, or the application of more restrictive burdens, not based on common sense nor justified by the experience of men who practically operate the railroad systems.

"Before we can have further extension and development of our transportation systems, there must be a modification of some of the influences that have been uppermost in the regulation of railroads in the past. We must be given "the square deal" that will enable us to guarantee fair returns to the investors, without whose money we cannot continue to make the extensions and betterments that the constantly increasing business of this country demands."

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Convention, May 6-9, St. Louis, Mo.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill. Annual meeting, June 17-20, Buffalo, N. Y.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Friday of March and September.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.

AMERICAN ELECTRICAL RAILWAY MANUFACTURERS' ASSOC.—George Keegan, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next meeting, May 21, New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, October 21-23, 1913, Montreal.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Convention, March 18-20, 1913, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Convention, June 11-13, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—M. H. Bray, N. Y. N. H. & H., New Haven, Conn.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.; annual, June, 1913.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wemlinger, 13 Park Row, New York; 2d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Convention, 3d week in January, 1913, Chicago.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago. Annual meeting, May 28, Atlantic City, N. J.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Semi-annual meeting, June, 1913, Atlantic City, N. J.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago; annual, May 20, 1913, St. Louis, Mo.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Meeting Dec. 10-11, 1912, New Orleans, La.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—H. A. Neally, Joseph Dixon Crucible Co., Jersey City, N. J. Meeting with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va. Next convention, June 18, Bluff Point, N. Y.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick building, Chicago. Annual meeting, May, 1913, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, Brown Marx building, Birmingham, Ala.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Annual meeting, August 18, Richmond, Va.

MAINTENANCE OF WAY MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—W. G. Wilson, Lehigh Valley, Easton, Pa. Convention, November 19-21, Chicago.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Convention, May 26-29, 1913, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Convention, June 16-18, Atlantic City, N. J.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Annual meeting, September 9-12, Ottawa, Can.

NATIONAL RAILWAY APPLIANCES ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

NORTHERN RAILROAD CLUB.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria, Ill.; 2d Tuesday.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo. Next meeting, August 12-15, Nashville, Tenn.

RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City Southern, Kansas City, Mo. Next meeting, Nov. 17, 1912, Cincinnati, Ohio.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa. Meetings, March 17, Chicago; June 10-11, New York; convention, October 14, Nashville, Tenn.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

RAILWAY TEL. AND TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Convention, September 8-12, 1913, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala. Next meeting, April 17, Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meeting with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago. Annual meeting, June 17, Los Angeles, Cal.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Annual meeting, August, 1913, Chicago.

UTAH SOCIETY OF ENGINEERS.—R. B. Ketchum, University of Utah, Salt Lake City, Utah; 3d Friday of each month, except July and August.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

The Southern Railway announces that its land and industrial department has opened three new offices—at Birmingham, Knoxville and Chattanooga.

B. A. Worthington, president of the Chicago & Alton, and J. A. Mack, president of the Traffic Club of New York, were guests of the Traffic Club of Chicago at a luncheon on November 14, and both made addresses.

At the annual election of the Traffic Club of St. Louis, on November 11, Clarence H. Howard, president of the Commonwealth Steel Company, was elected president, and A. F. Versen, assistant traffic commissioner of the Business Men's League of St. Louis, was re-elected secretary and treasurer.

A large delegation from the Des Moines Commercial Club, and from other points in Iowa, appeared before the Western Passenger Association on November 12, and presented arguments for the re-establishment of a 1½ cent per mile fare for the Iowa State Fair and other similar annual gatherings in Iowa. No decision was announced.

"Agricultural Activities" is the title of a pamphlet issued by the Pennsylvania Railroad for distribution in connection with its exhibits at the Land and Irrigation Exposition which is now being held in New York City. The pamphlet contains interesting pictures of the Pennsylvania Railroad demonstration farm and of other agricultural scenes in New Jersey.

The Chicago & Eastern Illinois, in connection with the Louisville & Nashville, Nashville Chattanooga & St. Louis, Western & Atlantic, Central of Georgia, Georgia Southern & Florida, Atlantic Coast and Florida East Coast, will about December 15 put on a train between Chicago and Florida, to be known as the Dixie de Luxe. The train will be made up wholly of Pullman cars through from Chicago to Palm Beach, via Evansville, Chattanooga, Atlanta and Jacksonville. It will leave Chicago about 10:30 a. m. daily, arriving at Jacksonville the next evening, and at Palm Beach the following morning.

Traffic Club of New York.

The annual meeting and dinner of the Traffic Club of New York will be held at the Aldine Club, November 26. After the dinner the election of officers will take place.

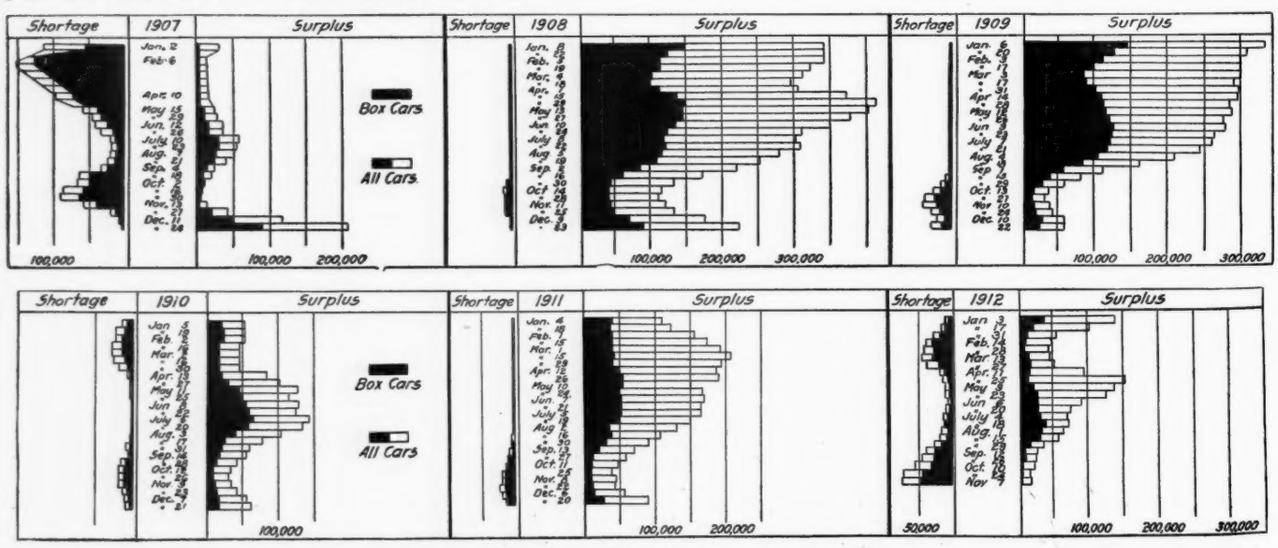
Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relation between railroads of the American Railway Association, in presenting statistical bulletin No. 131, giving a summary of car surpluses and shortages by groups from July 19, 1911, to November 7, 1912, says: The total surplus on November 7, 1912, was 19,897 cars; on October 24, 1912, 17,289 cars; and on November 8, 1911, 45,290 cars. Compared with the preceding period; there is an increase in the total surplus of 2,608 cars, made up as follows, 453 box, 354 flat, 2,139 coal, and a decrease of 338 miscellaneous car surplus. The increase in box car surplus is general throughout the country, except in groups 6 (Iowa, Illinois, Wisconsin and Minnesota), and 9 (Texas, Louisiana and New Mexico). The increase in flat car surplus is shown in groups 7 (Montana, Wyoming, Nebraska and the Dakotas), 8 (Kansas, Colorado, Oklahoma, Missouri and Arkansas), 9 (as above), 10 (Washington, Oregon, Idaho, California,

Car Surpluses and Shortages.

Date.	No. of roads.	Surpluses: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—November 7, 1912	7	0	0	52	21	73	1,326	264	529	167	2,286
" 2.— " 7, 1912	27	220	43	813	203	1,279	4,984	65	3,425	619	9,093
" 3.— " 7, 1912	30	0	50	698	12	760	8,085	157	3,431	914	12,587
" 4.— " 7, 1912	10	74	29	555	397	1,055	3,034	892	2,958	343	7,227
" 5.— " 7, 1912	21	25	0	38	540	603	5,276	1,590	1,092	115	8,073
" 6.— " 7, 1912	26	1,510	117	1,930	1,025	4,582	5,306	989	1,979	1,065	9,339
" 7.— " 7, 1912	3	0	167	17	533	717	834	0	223	0	1,057
" 8.— " 7, 1912	17	18	155	815	1,284	2,272	5,028	402	863	455	6,748
" 9.— " 7, 1912	13	230	48	265	522	1,065	1,943	168	264	105	2,480
" 10.— " 7, 1912	22	532	705	2,063	3,739	7,039	4,693	325	47	523	5,588
" 11.— " 7, 1912	7	23	237	16	176	452	5,954	312	0	412	6,678
Total, November 7, 1912	182	2,632	1,551	7,262	8,452	19,897	46,463	5,164	14,811	4,718	71,156
" " 8, 1911	165	9,507	3,041	16,398	16,344	45,290	13,290	730	2,986	1,770	18,776
" " 9, 1910	156	9,814	2,181	4,981	17,605	34,581	11,959	1,450	5,515	2,076	21,000
" " 10, 1909	171	16,107	3,622	6,536	10,351	36,616	21,386	1,956	11,730	4,830	39,902

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota and the Dakotas lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages from 1907 to 1912.

Nevada and Arizona), and 11 (Canadian lines). The increase in coal car surplus prevails throughout the country except in groups 2 (New York, New Jersey, Delaware, Maryland and eastern Pennsylvania), 5 (Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida), and 9 (as above). The decrease in miscellaneous car surplus is shown in groups 1 (New England lines), 2 (as above), 3 (Ohio, Indiana, Michigan and western Pennsylvania), 4 (the Virginias and Carolinas), 6 and 11 (as above).

The total shortage on November 7, 1912, was 71,156 cars; on October 24, 1912, 67,270 cars; and on November 8, 1911, 18,776 cars. Compared with the preceding period, there is an increase in the total shortage of 3,886 cars, an increase of 6,107 in box, 130 in flat, 1,214 in miscellaneous, and a decrease of 3,565 in coal car shortage. The increase in box car shortage appears in groups 2, 3, 5, 6, 9 and 11 (as above). The increase in flat car shortage is shown in groups 2, 3, 5, 6, 10 and 11 (as above). The decrease in coal car shortage is most apparent in groups 6, 7, 8 and 10 (as above). The increase in miscellaneous car shortage is general except in groups 3 and 9 (as above).

Compared with the same date of 1911; there is a decrease in the total surplus of 25,393 cars, of which 6,875 is in box, 1,490 in flat, 9,136 in coal, and 7,892 in miscellaneous. There is an increase in the total shortage of 52,380 cars, of which 33,173 is in box, 4,434 in flat, 11,825 in coal, and 2,948 in miscellaneous cars.

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report, and totals for the country for corresponding dates in previous years; and the diagram shows total bi-weekly surpluses and shortages from 1907 to 1912.

Panama Canal Tolls.

President Taft has issued a proclamation prescribing the terms on which tolls are to be levied on vessels passing through the Panama Canal. The rate is $1.20 for each net ton. Each 100 cu. ft. of cargo space in a ship will be regarded as one ton. Vessels in ballast without passengers will be charged 40 per cent. less than the rate for vessels carrying passengers or freight. Warships other than transports, colliers, hospital and supply ships are to pay 50 cents per displacement ton. Transports and other auxiliaries are to pay $1.20 per ton. No per capita passenger toll will be required. These rates as here prescribed are based on recommendations by Emory R. Johnson, professor of transportation and commerce of University of Pennsylvania and are practically the same as the reduced rates through the Suez canal, which are to go into effect in 1913.

The terms of the president's proclamation are based on the report of Prof. Johnson, who was employed by the government to report on the probable traffic conditions of the canal. Professor Johnson, in his report, holds that there should be no discrimination in the tolls in favor of any class of vessel. Preferential treatment of coastwise shipping would not be likely to greatly benefit shippers or consumers, and these vessels already enjoy a great advantage in having a monopoly of the coastwise trade. He estimates that the annual cost of maintaining and operating the canal, with the interest on the capital invested in it, will amount to nearly twenty million dollars; and that the maintenance of the fortifications, the coaling stations for the navy, dry docks, the military garrison and other army and navy expenses will amount to another twenty millions.

Annual Meeting of the National Industrial Traffic League.

At the annual meeting of the National Industrial Traffic League, held in Chicago on November 14, the league adopted the report of the legislative committee, providing for the appointment of a committee representing the league for the purpose of conferring with a similar committee to be appointed by the carriers to engage in a joint conference with a view of devising ways and means for dealing with freight classification, similar to the plan employed in dealing with the questions of bills of lading, car demurrage and other matters of general interest. The Interstate Commerce Commission will be requested to arrange to bring about under its supervision a joint conference as recommended. The report also recommended for the consideration of the joint conference that the making of a classification of freight, and rules and regulations to which it shall be subject, be delegated to an expert committee to consist of not less than seven, nor more than fifteen members, to be in continuous session. According to the plans this committee would promulgate and publish a joint classification showing all items with ratings to be observed in each of the different classification territories, together with uniform descriptions of articles, package requirements, minimum weights, and so far as practicable, uniform rules and regulations. It was recommended that this committee adopt a uniform system of numbering or lettering classes in the conversion thereof, maintaining ratings consistent with the scale of rates applying in each territory. The scheme would provide for public hearings for the consideration of petitions, to be held quarterly, and a member of the Interstate Commerce Commission, or an authorized representative would be requested to be present and participate in such hearings. The league placed itself on record as opposed to the passage of Senate bill S. 6,099, which would authorize the Interstate Commerce Commission to determine and prescribe a uniform classification of freight to be applied throughout the country.

Officers of the league were elected as follows: President, J. M. Belleville, traffic manager, Pittsburgh Plate Glass Co., (re-elected); vice-president, H. G. Wilson, commissioner of the Transportation Bureau of the Kansas City Commercial Club (re-elected); secretary and treasurer, Oscar F. Bell, traffic manager, Crane Company.

At the annual banquet in the evening addresses were made by Stephen A. Foster, formerly judge of the municipal court of Chicago, who advocated an extension of the powers of the Interstate Commerce Commission to include the regulation of the equipment and operation of the carriers, and by Orville F. Berry, chairman of the Railroad and Warehouse Commission of Illinois, who discussed the question of car shortage and methods of obtaining the greatest efficiency from the available car supply. Mr. Berry said that the railways should not be held entirely at fault, and the patrons entirely faultless for conditions of car shortage, for in many instances the lack of efficiency can be traced to the failure of both carrier and shipper.

INTERSTATE COMMERCE COMMISSION.

Rates on Staves Reduced.

National Lumber Exporters' Association et al v. Kansas City Southern et al. Opinion by the commission:

The commission found that the rate of 20 cents per 100 lbs. charged for the transportation of staves from Rust and Hatfield, Ark., to New Orleans for export were unreasonable to the extent that it exceeded 18 cents, the rate contemporaneously in effect on lumber. Reparation was awarded. (25 I. C. C., 78.)

Rates on Corn, Oats, Etc., Not Increased.

In re investigation and suspension of advances in rates by carriers for the transportation of corn, oats, feed, and other commodities in carloads from stations on Chicago, Milwaukee & St. Paul in Iowa, Minnesota and South Dakota to stations on Minneapolis, St. Paul & Sault Ste. Marie in North Dakota. Opinion by Chairman Prouty:

The commission found that the carriers did not justify the proposed advances and ordered that the present rates should apply in future. (25 I. C. C., 46.)

Banana Rates Reduced.

Davidson Brothers v. Louisville & Nashville. Opinion by the commission:

The complainant contends that the rate of 79 cents per 100 lbs. for the transportation of bananas in carloads from New Orleans, La., to Glasgow, Ky., is unreasonable and seek reparation. The commission found that the present rate is based on the standard distance scale, applied to the continuous mileage of the Louisville & Nashville, which is 728 miles, and that a shorter route is available via the Illinois Central and the Louisville & Nashville, which is 667 miles. This latter route is the one actually traversed by the shipments. The commission found, therefore, that the present rate of 79 cents per 100 lbs. is unreasonable to the extent that it exceeds 50 cents per 100 lbs., and prescribed that rate for the future. Reparation was awarded. (25 I. C. C., 103.)

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF SEPTEMBER, 1912.

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total. inc. misc.	Way and structures.	Of equipment.	Traffic.	Trans-portation.	General.	Total.					
Alabama Great Southern	309	$267,547	$110,180	$412,440	$49,233	$80,627	$12,158	$130,381	$9,152	$281,551	$130,889	—$136	$14,415	$116,338	—$898
Arizona Eastern	366	157,743	35,981	205,827	19,652	12,002	2,482	47,630	7,606	89,372	116,455	212	6,097	110,570	58,665
Atlanta, Birmingham & Atlantic	662	185,309	59,570	262,276	41,655	38,695	17,402	101,057	11,247	210,056	52,220	.....	12,500	39,720	—49,867
Atlantic & St. Lawrence	167	80,730	35,430	127,892	52,278	14,837	4,129	41,555	2,632	115,431	12,461	.....	7,314	5,147	18,841
Baltimore & Ohio—System	4,455[1]	6,757,034	1,506,857	8,766,371	1,271,102	1,654,498	161,300	2,884,309	163,358	6,134,567	2,631,804	—77,068	240,890	2,313,846	—217,748
Belt Ry. Co. of Chicago	21	.....	.....	259,194	14,214	31,215	522	105,034	8,808	159,793	99,401	.....	6,566	92,835	6,601
Butte, Anaconda & Pacific	46	80,755	19,215	110,943	15,169	19,654	671	49,535	3,340	88,369	22,574	.....	2,000	20,574	—2,260
Canadian Pacific Lines in Maine	233	46,595	23,396	77,015	36,121	10,420	5,523	33,777	4,332	90,173	—13,158	.....	10,000	—23,158	—22,840
Central of New Jersey	669[2]	1,769,362	521,445	2,425,155	223,684	328,949	34,754	707,579	42,410	1,337,376	1,087,779	—19,932	219,104	848,743	—152,828
Central Vermont	411	222,576	130,216	380,673	48,823	48,731	8,374	165,180	7,925	279,033	101,640	156	12,200	89,596	—7,300
Chesapeake & Ohio Lines	2,309[3]	2,225,147	587,634	2,932,430	386,610	595,020	55,149	857,703	63,417	1,957,899	974,531	10,364	102,155	882,740	—142,001
Chicago & Eastern Illinois	1,275	994,211	279,656	1,386,943	217,974	312,223	25,020	498,900	37,777	1,091,894	295,049	—1,683	42,000	251,366	—126,004
Chicago & Erie	270	393,660	71,214	508,916	109,107	92,881	20,339	228,562	10,199	461,088	47,828	—3,785	12,895	31,148	—23,914
Chicago, Indianapolis & Louisville	617	416,461	164,601	634,868	93,353	75,745	17,773	212,139	15,086	414,096	220,772	.....	23,651	197,121	—5,630
Chicago Junction	12	.....	.....	169,094	20,246	12,394	1,817	77,012	5,050	116,519	52,575	.....	2,185	50,390	1,058
Cincinnati, New Orleans & Texas Pacific	337	634,291	159,828	837,968	78,760	197,186	23,338	218,930	17,230	535,444	302,524	527	29,800	273,251	—53,461
Colorado & Southern	1,073[4]	547,787	152,599	747,341	104,035	169,942	10,389	218,024	21,229	523,619	223,722	—347	29,175	194,200	—19,669
Detroit & Toledo Shore Line	79	108,076	.....	108,719	20,823	6,139	1,210	28,853	2,312	59,337	49,382	.....	4,650	44,732	3,886
Detroit, Grand Haven & Milwaukee	191	125,000	69,000	221,591	57,259	25,934	7,780	102,085	4,943	198,001	23,590	78	2,953	20,715	—49,495
Duluth, South Shore & Atlantic	626[5]	180,056	96,763	289,360	74,459	34,164	7,977	102,493	8,476	227,569	61,791	1,595	18,000	45,386	—57,762
Erie	1,988[6]	3,400,003	852,521	4,612,149	597,958	731,622	90,781	1,476,908	85,087	2,982,356	1,629,793	—2,041	138,546	1,489,206	200,649
Galveston, Harrisburg & San Antonio	1,338	804,960	257,007	1,110,461	69,753	204,875	29,894	379,070	25,883	709,475	400,986	—3,928	35,123	361,935	—25,504
Grand Trunk Western	347	379,000	196,000	613,040	86,515	74,604	21,279	232,422	13,407	428,227	184,813	772	29,877	155,708	—9,053
Great Northern	7,487[7]	5,747,941	1,373,599	7,557,936	1,027,851	759,351	101,219	1,775,331	108,636	3,772,388	3,785,548	37,018	288,942	3,533,624	223,145
Hocking Valley	352	565,452	85,879	698,783	66,925	124,083	8,390	193,920	15,159	408,477	290,306	.....	34,800	255,506	12,735
Houston, East & West Texas	191	69,395	30,496	104,421	19,677	12,556	2,077	34,087	3,584	71,981	32,440	.....	3,940	28,500	—18,827
Houston & Texas Central	789	459,077	169,092	665,719	53,851	108,531	18,400	238,112	16,081	434,975	230,744	—1,277	20,264	209,203	—67,096
Illinois Central	4,763	3,595,925	1,224,751	5,518,660	819,778	1,175,384	108,652	1,998,459	126,120	4,228,393	1,290,267	—9,732	237,750	1,042,785	41,055
Lehigh & Hudson River	97	146,589	4,934	153,521	27,407	20,321	1,302	49,515	3,738	102,283	51,238	.....	4,000	47,238	8,686
Louisiana Ry. & Navigation	351	107,474	26,153	144,286	20,836	18,892	5,951	51,998	5,933	103,610	40,676	.....	5,500	35,176	—20,936
Louisiana Western	208	106,258	58,218	172,135	17,398	31,862	6,336	50,625	5,285	111,506	60,629	78	6,828	53,879	2,196
Louisville & Nashville	4,723[8]	3,476,525	1,152,122	4,932,818	745,420	891,781	98,078	1,571,908	104,085	3,411,272	1,521,546	—3,922	153,242	1,364,382	—79,187
Louisville, Henderson & St. Louis	200	64,781	40,605	110,346	25,336	15,427	4,204	37,767	2,789	85,523	24,823	26	3,000	21,849	—19,067
Michigan Central	1,817[9]	1,782,450	837,101	2,901,687	355,621	440,718	63,345	1,043,604	45,948	1,949,236	952,451	3,358	116,000	839,809	—134,120
Minneapolis, St. Paul & Sault Ste. Marie	3,893[10]	2,046,138	633,300	2,823,205	323,954	280,870	60,640	769,629	47,957	1,483,050	1,340,155	25,568	162,603	1,203,120	27,107
Missouri, Kansas & Texas Ry. System	3,398	1,995,828	797,587	2,943,529	412,195	371,230	54,689	959,670	70,216	1,868,000	1,075,529	—3,578	101,206	970,745	193,819
Missouri Pacific	3,920[11]	1,906,601	474,605	2,619,755	434,907	450,672	60,084	1,032,647	78,476	2,056,786	562,969	—622	93,390	468,957	312,798
Morgan's La. & Tex. R. R. & S. S. Co.	404	258,654	100,502	381,097	59,327	71,806	11,502	137,499	10,298	295,432	85,665	—2,748	18,370	64,547	—10,228
Nevada Northern	165	117,056	14,434	135,208	17,120	15,723	374	29,908	3,335	66,460	68,748	.....	6,223	62,525	5,418
New Orleans, Texas & Mexico	277[12]	93,422	17,753	118,906	28,503	12,635	2,444	53,209	5,395	102,186	16,720	.....	1,292	15,428	9,494
New York, Chicago & St. Louis	564[13]	887,979	142,100	1,067,527	148,018	115,111	46,653	402,200	12,211	724,193	343,334	—927	36,000	306,407	56,942
New York, Ontario & Western	566	606,614	160,339	822,887	123,085	125,805	12,714	302,219	19,277	583,100	239,787	—1,717	18,166	219,904	26,759
New York, Susquehanna & Western	154[14]	163,485	49,837	238,222	36,287	25,920	1,625	93,790	4,847	162,469	75,753	1,874	17,648	59,979	—30,706
Norfolk & Western	2,018[15]	3,101,915	461,057	3,677,874	511,356	660,523	57,655	1,066,257	69,130	2,364,921	1,312,953	—3,490	120,000	1,189,463	—85,563
Norfolk Southern	562	163,666	68,849	255,407	30,032	34,251	5,138	76,102	13,780	159,303	96,104	—561	7,510	88,033	7,332
Northwestern Pacific	401[16]	156,479	183,188	362,509	49,103	32,653	3,163	115,270	13,499	213,689	148,820	.....	12,579	136,241	3,517
Oregon Short Line	1,762[17]	1,467,600	480,014	2,049,671	195,884	191,676	27,214	475,893	41,432	932,099	1,117,572	2,797	117,913	1,002,456	121,056
Peoria & Eastern	352	240,543	69,136	328,613	41,942	67,942	5,176	109,846	5,963	230,869	97,744	.....	9,800	87,944	25,024
Pittsburgh, Shawmut & Northern	279[18]	134,671	10,944	148,666	19,455	34,201	1,298	46,150	3,913	105,017	43,649	.....	1,581	42,068	5,392
Richmond, Fredericksburg & Potomac	83	96,088	83,012	203,243	27,394	27,566	3,025	75,964	6,244	140,193	63,050	.....	714	62,336	5,213
St. Louis & San Francisco	4,742[19]	2,544,270	1,007,901	3,802,114	513,131	471,391	84,302	1,275,876	101,795	2,446,495	1,355,619	.....	186,348	1,169,271	189,042
St. Louis, Brownsville & Mexico	510	156,899	80,947	251,956	36,591	28,266	5,392	103,663	9,556	183,468	68,488	.....	5,500	62,988	—19,377
St. Louis, Iron Mountain & Southern	3,318[20]	1,885,299	564,541	2,713,689	528,906	428,229	50,104	852,186	75,436	1,934,861	778,828	—1,793	90,795	686,240	73,964
St. Louis Merchants' Bridge Terminal	9	.....	358	179,387	27,730	7,301	684	82,782	8,412	126,909	52,478	.....	6,100	46,378	14,208
St. Louis Southwestern Ry. of Texas	703	281,758	102,325	408,794	55,067	73,956	11,167	157,335	17,329	314,854	93,940	—284	10,300	83,356	—19,731
San Pedro, Los Angeles & Salt Lake	1,135[21]	517,391	250,671	826,285	77,860	134,978	28,455	247,418	18,423	507,134	319,151	—1,928	31,550	285,673	158,893
Seaboard Air Line	3,070[22]	1,176,885	401,957	1,744,656	279,514	247,085	63,043	646,880	59,163	1,295,685	448,971	—2,798	81,000	365,173	—113,257
Southern Kansas of Texas	125	129,525	19,809	154,807	11,896	21,412	2,267	38,898	3,562	78,035	76,772	.....	2,571	74,201	82,995
Southern Pacific Co.	6,311[23]	5,386,294	2,702,198	8,658,586	730,423	1,103,974	169,900	2,236,354	201,203	4,441,854	4,216,732	145,107	351,878	4,009,961	322,139
Spokane, Portland & Seattle	556[24]	274,086	145,087	457,145	47,721	39,388	7,790	108,915	12,198	216,012	241,133	178	53,400	187,911	28,871
Syracuse, Binghamton & New York	81	63,520	50,811	126,572	18,834	14,758	2,732	41,058	2,144	79,526	47,046	.....	6,820	40,226	941
Tennessee Central	294	84,793	46,649	138,435	29,670	15,285	6,150	44,121	7,478	102,704	35,731	.....	4,265	31,466	—6,687
Terminal R. R. Ass'n of St. Louis	34[25]	.....	252	257,880	37,209	13,558	924	85,698	8,129	145,518	112,362	10,631	29,900	93,093	20,195
Texas & New Orleans	458	213,156	97,040	333,796	57,656	75,806	6,936	125,845	12,490	278,733	55,063	5,861	13,384	47,540	—32,518
Toledo, Peoria & Western	248	72,344	45,206	123,401	18,559	23,894	2,201	42,092	3,299	90,045	33,356	.....	4,800	28,556	8,139
Toledo, St. Louis & Western	451	288,053	36,948	345,094	54,869	48,313	10,674	112,762	9,493	236,111	108,983	.....	14,800	94,183	29,349
Virginia & Southwestern	240	119,627	15,113	139,715	23,524	32,284	1,939	39,872	3,478	101,097	38,618	.....	5,000	33,618	—24,446
Wabash	2,515	1,934,469	692,806	2,962,654	371,382	461,030	79,428	1,068,780	64,075	2,044,695	917,959	—3,347	71,655	842,957	151,192
Washington Southern	36	31,319	40,257	94,468	14,125	10,203	1,074	35,686	3,057	64,145	30,323	.....	3,173	27,150	—19,984
Western Pacific	937	431,134	134,978	583,900	68,629	38,381	27,963	197,645	25,104	357,722	226,178	873	19,834	207,217	70,004
Western Ry. of Alabama	133	59,761	47,136	113,875	16,267	19,073	5,028	30,390	5,179	75,937	37,938	—406	4,640	32,892	—3,550
Wheeling & Lake Erie	459[26]	631,337	68,008	735,612	99,810	119,061	8,669	215,300	15,099	457,939	277,673	1,760	29,808	249,625	1,767
Yazoo & Mississippi Valley	1,374	565,063	222,156	847,017	170,841	125,676	15,293	349,294	25,083	686,187	160,830	213	37,000	120,043	1,379

Average mileage operated during previous period—[1] 4,434; [2] 672; [3] 2,242; [4] 1,194; [5] 617; [6] 1,995; [7] 7,345; [8] 4,699; [9] 1,805; [10] 3,770; [11] 3,916; [12] 264; [13] 561; [14] 152; [15] 2,004; [16] 404; [17] 1,667; [18] 240; [19] 4,732; [20] 3,314; [21] 1,113; [22] 3,046; [23] 6,183; [24] 551; [25] 35; [26] 457. — Indicates Deficits, Losses and Decreases.

Coal Rates Reduced.

Union Tanning Company et al. v. Southern Railway et al. Opinion by the commission:

The commission found that the rates on coal from the Appalachian and Dante fields of southwestern Virginia to Old Fort and Morganton, in North Carolina, were unduly discriminatory as compared with the rate from the same fields to Canton, N. C., and the defendants were required to remove such discrimination. Reparation was denied. (25 I. C. C., 112.)

Milling-in-Transit Privileges from Milwaukee.

In re investigation and suspension of new milling-in-transit regulations at certain stations on the Chicago & North Western and the Chicago, St. Paul, Minneapolis & Omaha. Opinion by Chairman Prouty:

The tariff under suspension herein limits the territory into which grain can be shipped from Milwaukee, when milled or treated in transit at that point; but the commission found that it is liberal to Milwaukee as a milling and grain-handling point, and that there is no reason why mills at Milwaukee should reach in competition with mills between Minneapolis and Milwaukee the great bulk of this intermediate territory, involving in most instances as such an arrangement does a long back haul, or its equivalent, from Milwaukee. The order of suspension was vacated. (25 I. C. C., 90.)

Transit Charges Reduced.

George M. Speigle v. Southern Railway. Opinion by Chairman Prouty:

The commission found that a transit charge is a regulation or practice affecting the rate of which the commission has jurisdiction, and under this it is competent to inquire whether such charge is excessive. *National Wool Growers' case,* 23 I. C. C., 151, cited and followed. In *Speigle v. Southern Railway,* 19 I. C. C., 522, the commission found that the practice of the defendant of collecting transit charges of 1 cent per 100 lbs. on shipments of lumber at Johnson City, Tenn., and 2 cents per 100 lbs. at Newport, Tenn., was discriminatory against Newport. The defendants increased the rate at Johnson City to 2 cents per 100 lbs. Although the complainant's lumber mill is at Newport it attacks the reasonableness of the present charge at Johnson City with the idea that if that rate is reduced the rate at Newport will be similarly reduced. The commission based its decision on an investigation of the cost of the service to the carrier. It was found that although the minimum weight on these shipments was 30,000 lbs., the average weight was between 40,000 lbs. and 50,000 lbs. At the present rate, the revenue per car would therefore average between $8 and $10. It was also found that the cost of the service to the carrier averaged something less than $6 per car. The commission found that the present rate of 2 cents per 100 lbs. was unreasonable to the extent that it exceeded 1½ cents per 100 lbs., and prescribed that rate for the future. (25 I. C. C., 71.)

Transit Charges Reduced.

Bristol Door & Lumber Company et al. v. Norfolk & Western et al. Opinion by Chairman Prouty:

The complainant contends that the increase of the transit charge at Bristol, Va.-Tenn., from 1 cent per 100 lbs., to 2 cents per 100 lbs., is unreasonable, and seeks reparation. The commission's decision was based on its findings in *George M. Speigle v. Southern Railway,* 25 I. C. C., 71, noticed above. The present rate of 2 cents per 100 lbs. was found unreasonable and discriminatory, and a transit rate of 1½ cents per 100 lbs. was prescribed for the future. Reparation was awarded. (25 I. C. C., 87.)

Relief From the Fourth Section.

Edwards & Bradford Lumber Company v. Chicago, Burlington & Quincy. Opinion by the commission:

In re application for relief from the provisions of the fourth section by the Chicago, Burlington & Quincy. Opinion by the commission:

As these two cases involved the same question they were treated in the same report. The complainant contends that the defendant should not be permitted to charge higher rates from Chicago to Sioux City than to South Sioux City, through which the shipments to Sioux City have to move. The commission found that although Sioux City is intermediate to South Sioux City by the short routes, it is not by the route of the Chicago, Burlington & Quincy, which is a circuitous one. The Burlington contends that it is forced to charge lower rates to Sioux City than to South Sioux City to meet the competition of the other roads which charge higher rates to South Sioux City than to Sioux City. The commission found that relief should be granted from the fourth section on all traffic originating at and east of Chicago, where the rate to Sioux City is based upon or controlled by that from Chicago.

The commission also found that the Chicago, Burlington & Quincy should be permitted to make the higher rate to South Sioux City and points south as far as Plattsmouth (where it crosses the Missouri river) from all the junction points on its line between Chicago and the Missouri river, and in the state of Missouri, where the line of the Burlington exceeds by at least 15 per cent. the short line.

The carrier showed no justification for charging a higher rate at the points between Plattsmouth and South Sioux City upon traffic originating at St. Louis or upon traffic where the rate is determined by combination upon St. Louis, or is controlled by the St. Louis rate. Relief from the fourth section with respect to this traffic was denied. (25 I. C. C., 93.)

Alma, Neb., Discriminated Against.

W. H. Lewis v. Chicago, Burlington & Quincy et al. Opinion by the commission:

The complainant alleges that the rates on coal from Lynn and Big Four, in the Walsenburg district in southern Colorado, from South Canon, Colo., on the Colorado Midland, and from Oak Creek, Colo., on the Denver, Northwestern & Pacific, to Alma, Neb., are unjust, unreasonable, and unduly discriminatory, and claims reparation on basis of the decision in *Nebraska State Ry. Com. v. C. B. & Q.,* 23 I. C. C., 121, in which case the commission decided that the practice of the carriers of charging higher rates from the Walsenburg district to Minden "K," than to Minden, because Minden was on the main line to Grand Island, and Minden "K," though only a few blocks from Minden, was on a line which had no physical connections with the main line either at Minden or Minden "K," and could not therefore be said to be intermediate, was unduly discriminatory against Minden "K" in favor of Minden, and ordered that Minden "K" and intermediate points be given the same rate as Minden. Reparation on shipments which moved prior to the above decision from Lynn and Big Four to Alma, which is intermediate to Minden "K," was denied. Charges from Oak Creek to Alma were reduced at the same time to remove the discrimination, and the commission found that they are not unreasonable. The rates from South Canon are still higher to Minden "K," Sacramento, and points intermediate, including Alma, than to Minden, and the commission found that although it could not at present make any ruling on the question of their reasonableness, they were discriminatory, and ordered that the rates to Minden should apply on shipments to Minden "K" and intermediate points. No reparation was awarded. (25 I. C. C., 97.)

The Milling-in-Transit Case.

The Interstate Commerce Commission has issued a supplemental report written by Commissioner McChord, to the transit case, 24 I. C. C., 340, mentioned in the *Railway Age Gazette* of July 12, page 75, modifying in many instances the former regulations on milling in transit of grain. The report says in part as follows:

"The respondents have published their respective tariffs presumably in accordance with their interpretation of the requirements of the order. The lines in Trunk Line, Central Freight Association, and Southeastern and Mississippi Valley territories have adhered to or adopted the publication of uniform rules and regulations of policing at their respective inspection bureaus, thereby bringing about more effective policing and uniformity of operation." The report then criticizes the operation of the rules in territory west of the Mississippi river and suggests many improvements, and then goes on to say: "In dealing with the question of reports we said that transit houses should be required to report daily

the total in and out movement of all grain, if any of it were to be accorded a transit privilege. Instances arise in which a transit house receives or ships several kinds of grain, but the transit privilege applies only to wheat. In such cases no report is necessary as to the other kinds of grain, but is essential as to all wheat whether transit or non-transit handled through the house. In other words, the daily report need cover only the commodity or commodities upon which a transit privilege is granted, but, as to those commodities, must include both the transit and non-transit. Again on days when the transit house receives or ships no grain of any kind upon which transit is accorded, and the report would be but a duplicate of that made for the preceding day, it will be sufficient if the report merely states that fact. To this extent our previous order is modified.

"Complaint has been made that our order requires that too great a percentage be deducted to cover the loss incident to the drying of corn. The order makes no final arbitrary deduction, but specifically provides the actual out-turn of the grain shall be credited to the miller in his transit account not less than four times a year, quarterly, leaving it optional with the miller and the carrier to make the actual balance monthly, weekly, or daily as the exigencies of the case may require. Nothing was said in connection with the drying of wheat. It appears that some wheat is of such a character that it is necessary to subject it to a drying process, thereby entailing a loss in weight. This loss can be taken care of by making the proper deduction at the time of balancing the tonnage account, not less than four times a year, quarterly."

The commission does not approve of the regulation whereby pound for pound can be substituted at milling points. On this subject the report says in part:

"At many of the points there is a supply of non-transit grain and a disposition of non-transit products. Where the through rates applicable to the various through routes via the transit point vary the opportunity for substitution is clearly apparent. If, therefore, flour can be shipped, pound for pound, for wheat received by the surrender of no particular billing, the integrity of the though rate is affected, and tonnage of flour which could not have been produced covered by the inbound billing surrendered is substituted. The same substitution would be present in the case of the by-products. If accounts are kept of each kind and character of grain reaching the milling point via each road, and care is taken that the outbound shipments in a given account are made either over the road bringing the grain into the milling point or over a road forming part of the through route with the inbound road, it would not be absolutely necessary to preserve the ratio on each individual car of grain or as to each line of railroad passing through the transit point. The lawful character of the operation of transit in this connection is largely a transportation question and one that for all practical purposes the carriers can take care of by so publishing their rates as to make lawful what would otherwise be clearly unlawful. If the carriers have permitted business to develop at points on their lines through the enjoyment of illegal practices, it would be natural to suppose that they would now do all in their power to bring such business within the pale of the law with the least danger of loss to their patrons and the consequent depletion of their own revenues. These movements which are now illegal can be made legal by the carriers if they will adjust their through routes and rates so as to provide specifically for the movement of products in the same manner that they have heretofore moved without tariff authority. Moreover, the carriers could so adjust their rates that the millers would not be required to pay in the aggregate higher transportation charges upon business done in accordance with the law than they did on movements involving illegal substitutions."

STATE COMMISSIONS.

D. M. McIntyre, K. C., of Kingston, has been appointed chairman of the Ontario Railway & Municipal Board, succeeding Mr. Leitch.

E. C. Stern, of Milwaukee, has been appointed secretary of the Wisconsin railroad commission, to succeed John N. Winterbotham, resigned.

The Canadian Board of Railway Commissioners has suspended tariffs filed by the railway cartage companies of Eastern Canada providing for increases of five to ten cents a ton on freight. A hearing will be held December 17.

The Texas railroad commission has issued an order abolishing joint line express rates, and another order requiring the absorption of switching charges in cases where the railway receives as earnings from the car $7.50 or more above the present allowances fixed by the commission.

The Railway Commission of Canada has notified the railways that whenever an embargo is placed on any freight a copy of the notice must, within forty-eight hours, be sent to the commission, together with a statement of the conditions making the embargo necessary and the probable time it will be continued.

The railways of Oklahoma, through their attorneys, have filed a stipulation with the supreme court of the state, which was agreed to by the corporation commission, accepting the commodity freight rates recently established by the commission, with certain modifications. The cases had been appealed to the supreme court by the railways.

The Indiana State Railroad Commission has filed suit in the Circuit Court to recover $19,285.71 from the Lake Erie & Western for failure to install automatic block signals between Lafayette and Templeton. The commission ordered the company to equip its road with automatic block signals by January 1, 1912, but this time was extended by the commission for one year on all except that part of the road between Lafayette and Templeton, and this was ordered installed by July 1, 1912. The statutory penalty is $1,000 a week.

The Public Service Commission of New York, Second district, has ordered the Boston & Albany to run a local passenger train from Chatham to Albany, 22 miles, in the morning, to accommodate people who work in Albany and who would like to live in the country towns along the line of the B. & A. It appears that the railroad company is willing to carry out the order of the commission, though both the commission and the railroad officers agree that at present the prospects for passenger traffic are small. The country has natural attractions, but it has not been built up. The railroad is ordered to keep a detailed record of the passengers using the new train, and if the business is too small to warrant the continuance of the service it may apply for a modification of the commission's order.

COURT NEWS.

The Atchison, Topeka & Santa Fe has filed suit in the United States district court at Phoenix, Ariz., for an injunction restraining the enforcement of the 3-cent fare law passed by the legislature and approved by the voters on a referendum ballot at the election on November 5.

The Texas Supreme Court has rendered a decision sustaining the constitutionality of a law empowering the Texas railroad commission to prescribe an accounting system for the railways of the state. The decision, however, in the case of Texas & Pacific et al. vs. the Commission, was in favor of the railways, holding that some of the rules of accounting adopted by the commission are not in conformity with the statute.

Rates Affected by the Key West Extension.

The decision of the Commerce Court approving a reduction of freight rates on the Florida East Coast was reported in the *Railway Age Gazette*, November 15, page 967. The views of the court on the claim of the railroad company that the order of the Interstate Commerce Commission was confiscatory are as follows:

The basis for the contention that the order is confiscatory is the claim that the entire property has a present value in excess of the bonded indebtedness of $31,000,000 and the capital stock of $5,000,000; that the net revenues for the year ending June 30, 1911, were less than 4 per cent. of this value; and that if the line, not from Homestead, but from Miami,* north, be considered as the main line, the entire net revenues therefrom, after deducting that part thereof derived from passenger and freight traffic originating at or destined to points south of Miami,

*Miami is 366 miles south of Jacksonville; Homestead is 394 miles from Jacksonville, and Key West 522 miles.

would yield but little over 4 per cent. of its present value, whereas the legal rate of interest in Florida is 8 per cent.

This claim is based on two assumptions: (*a*) that the main line ends at Miami and not at Homestead; (*b*) that the value of the company's entire property, including the so-called over-sea extension, and not merely of the main line itself, must be considered in determining whether rates from points on the main line are confiscatory.

Without at this time considering under what circumstances, if any, the reduction of particular rates can be held to violate the constitutional rights of a carrier, because thereby the total revenues become inadequate, even though the particular reduced rates yield some contribution to the general net revenues over and above the pro rata cost of service, we are of the opinion that in the present case there can be no basis for a charge of confiscation, because neither of the assumptions above stated and upon which it is based is sound.

(*a*) Originally the road ended at Miami; later on, however, and before the act of 1905 in reference to the over-sea extension hereinafter referred to was adopted, it was extended to Homestead.

In its plant or construction account, the company itself, in its own bookkeeping, deals with the line from Miami to Homestead as part of the main line and not of the over-sea extension. The increased production in the territory between Miami and Homestead since 1908 demonstrates the wisdom of the construction of this piece of road as part of the main line, independently of the over-sea extension. We are clearly of the opinion that the main line must be considered as ending at Homestead. Without discussing the evidence in detail, we are further of the opinion that the net revenues on this main line are in excess of 8 per cent. on the present fair value of the property, and not merely something over 6 per cent., as conceded by the petitioner.

No possible question of confiscation can arise under these circumstances, even if the effect of the order will be to reduce the gross, or even the net revenues, of the company for the next two years by the full amount of the difference in rates, amounting, as applied to the tonnage for the year ending June 30, 1911, to $131,000, and being about 3 per cent. of the gross, and 10 per cent. of the net operating revenue of the main line.

(*b*) Whatever the powers of the company may be under its amended charter, it was not until after the legislature of Florida passed an act in May, 1905, to encourage and secure the construction of the railway from the mainland to Key West . . . that the company, at a stockholders' meeting, decided to construct the over-sea extension.

The tremendous cost of the line from Homestead to Key West, over $175,000 a mile, the scarcity of population along the route, the natural impossibility of ever making much of the territory productive, either agriculturally or industrially, confirm the recital in the act of 1905 that the purpose of the extension was to share in the traffic expected to pass through the Panama Canal, unless, indeed, this marvel of engineering skill was constructed as a monument to the man, who from the early days to the present was and is the sole owner of the petitioner's stock and to whose indomitable energy and supreme confidence in the future prospects of this section of the country the road primarily owes its construction. At the present time the operating expenses of this extension are naturally in excess of its revenues. Its entire gross revenues—freight and passenger—for the year ending June 30, 1911, were less than $100,000. The contention that the earnings of the main line on passengers who traveled over the extension is to be attributed to the extension cannot be sustained. There is no evidence that would justify this court in holding that the extension produced any considerable increase of travel on the main line or that most of the passengers to Cuba via Key West would not have gone to or via Miami or Homestead if the extension had not been built.

To what extent shippers on an original or main line should bear increased burdens due to the construction of additional or branch lines must depend upon the particular circumstances of each case. No general rule can be formulated. In our opinion, the commission was fully justified in disregarding the value of this extension, and this court, in determining whether or not the order of the commission operates to confiscate petitioner's property, must likewise at this time and at this stage in the development of the business on the extension and on the main line, reach its conclusions irrespective of the value of the over-sea extension.

Railway Officers.

Executive, Financial and Legal Officers.

F. W. Sargent has been appointed attorney for Iowa, of the Rock Island Lines, succeeding J. L. Parrish, resigned.

The authority of W. L. Stanley, general claim agent of the Seaboard Air Line at Portsmouth, Va., has been extended over the Tampa Northern.

W. E. Stavert, of Montreal, Quebec, has been elected president and general manager of the Alaska Northern, to succeed O. G. Laberee, resigned.

F. J. Eaton has been appointed acting auditor of the Rutland Railroad, the Rutland Transit Company and the Ogdensburg Terminal Company, with headquarters at Rutland, Vt., succeeding M. H. Chamberlin, deceased.

Richard Kirkwood has been appointed auditor of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn. A. R. Marshall has been appointed assistant auditor, with office at Minneapolis, Minn.

W. S. McChesney, Jr., president and general manager of the Terminal Railroad Association of St. Louis, has been elected president also of the Wiggins Ferry Company, with headquarters at St. Louis, Mo., succeeding W. K. Kavanaugh, president and general manager, resigned.

Operating Officers.

J. B. Heafer has been appointed assistant general manager of the International & Great Northern, with office at Houston, Tex.

Wm. Hall has been appointed assistant trainmaster of the Grand Trunk with office at Hamilton, Ont., succeeding L. Harold, assigned to other duties.

George B. Harrison, superintendent of the Texas & Pacific at Westwego, La., also has been appointed superintendent of the Transmississippi Terminal Company.

Richard Doyle, assistant superintendent of the Chicago & Alton, has been appointed trainmaster of the Mississippi River & Bonne Terre, with office at Bonne Terre, Mo.

The authority of H. W. Stanley, assistant general manager, and J. M. Shea, general superintendent of the Seaboard Air Line, with offices at Portsmouth, Va., has been extended over the Tampa Northern.

E. S. Heyser has been appointed trainmaster of the St. Louis, Brownsville & Mexico, with office at Kingsville, Tex. He will continue to perform the duties of roadmaster, with jurisdiction between Kingsville and Brownsville.

E. H. De Groot, superintendent of the St. Louis division of the Chicago & Eastern Illinois, has been appointed superintendent of transportation, with headquarters at Chicago, succeeding J. M. O'Day, resigned. P. S. Sampson, division superintendent at Salem, Ill., succeeds Mr. De Groot at St. Louis, Mo.

F. M. Barker, inspector of transportation of the Lehigh Valley, at South Bethlehem, Pa., has been appointed assistant superintendent with office at Wilkesbarre. P. T. Reilly, trainmaster at Wilkesbarre, succeeds Mr. Barker. Frank S. Mitten, chief train despatcher at Wilkesbarre, succeeds Mr. Reilly, and P. F. Carroll, succeeds Mr. Mitten.

J. H. Curtis has been appointed superintendent of car service of the Bangor & Aroostook, with office at Bangor, Maine. The office of general superintendent having been abolished, the division superintendents and such other officials as heretofore have reported to the general superintendent, will until further advised report to Percy R. Todd, vice-president, at Bangor.

The jurisdiction of Thomas J. Foley, general manager of the Illinois Central, J. M. O'Day, superintendent of transportation, George W. Berry, general superintendent at Memphis, Tenn., and Sullivan S. Morris, chairman of the General Safety Committee, extends also over the Yazoo & Mississippi Valley. The appointments on the Illinois Central were noted in our issue of November 15.

L. B. McDonald has been appointed superintendent of the Houston terminals of the Sunset-Central Lines, with office at

Houston, Tex., to succeed H. J. Micksch, who has been appointed assistant superintendent of the Houston East & West Texas and the Houston & Shreveport, with headquarters at Houston. J. F. Hough has been appointed assistant superintendent of the Victoria division of the Galveston, Harrisburg & San Antonio, with office at Victoria, Tex., in place of L. B. McDonald. W. Bretschneider has been appointed an assistant superintendent of the Texas & New Orleans and the Galveston division of the Galveston, Harrisburg & San Antonio, with headquarters at Houston, succeeding C. A. Thanheiser, resigned.

F. L. Campbell, whose appointment as superintendent of the Michigan division of the Vandalia, with office at Logansport, Ind., has been announced in these columns, was born October 9, 1858, at Evansville, Ind. He began railway work as yard clerk for the Vandalia at Terre Haute, Ind., in April, 1879, and held various positions in the yard and train service until March, 1894, when he was made trainmaster of the Peoria division. In March, 1896, he assumed the duties of road foreman of engines in addition to those of trainmaster, and from December, 1901, to November 1, 1906, was trainmaster of the St. Louis division. On the latter date Mr. Campbell became superintendent of the Peoria division, which position he held until his recent appointment as superintendent of the Michigan division. His entire railway service has been with the Vandalia.

William D. Wiggins, whose appointment as superintendent of the Peoria division of the Vandalia, with headquarters at Decatur, Ill., has been announced in these columns, was born April 28, 1873, at Richmond, Ind., and was graduated from the Rose Polytechnic Institute at Terre Haute, Ind., in 1895. He began railway work in 1895 as assistant on engineer corps on the Logansport division of the Pittsburgh, Cincinnati, Chicago & St. Louis. Mr. Wiggins held various positions in the engineering department of the Pennsylvania Lines west of Pittsburgh until June 16, 1901, when he was appointed engineer maintenance of way of the Cincinnati & Muskingum Valley, a subsidiary line of the Pennsylvania Lines. Shortly afterwards he was made engineer maintenance of way of the Marietta division of the Pennsylvania Lines, and in May, 1902, he was transferred to the Toledo division as engineer maintenance of way. Mr. Wiggins became division engineer of the Pittsburgh division on January 25, 1904, from which position he was promoted to superintendent of the Peoria division of the Vandalia on November 1.

Traffic Officers.

J. M. Norton has been appointed general agent of the Missouri Pacific-Iron Mountain system, with office at Seattle, Wash.

Howard Bruner, chief clerk in the traffic department of the Union Pacific has been appointed assistant general freight agent, with headquarters at Omaha, Neb.

J. E. Wilson, traveling passenger and advertising agent of the Pacific Coast Steamship Company at San Francisco, Cal., has been appointed assistant to passenger traffic manager.

H. G. McCausland has been appointed general agent of the Cheseapeake & Ohio, and J. G. Morgan has been appointed soliciting freight agent, both with offices at Lynchburg, Va.

C. P. Dowlin, chief clerk in the office of general freight agent of the Ft. Worth & Denver City, has been appointed assistant general freight agent, with headquarters at Ft. Worth, Tex.

Charles T. Mandel has been appointed assistant general passenger agent of the Carolina, Clinchfield & Ohio, with headquarters at Johnson City, Tenn., effective November 15.

F. A. Hills, Northern passenger agent of the Great Northern at Duluth, Minn., has been appointed general baggage agent, with headquarters at St. Paul, Minn., in place of C. H. Rupert, resigned.

John T. Smith has been appointed traveling freight agent of the Toledo, St. Louis & Western, with office at St. Louis, Mo., and George L. Bodie has been appointed contracting freight agent, with office at Toledo, Ohio.

C. W. Meldrum, city passenger agent of the Great Northern at Seattle, Wash., has been appointed assistant general passenger agent of that road and the Great Northern Steamship Company, with office at Seattle, in place of W. A. Ross, resigned.

The authority of L. E. Chalenor, freight traffic manager; G. S. Rains, general freight agent, and H. G. Waring, assistant general freight agent of the Seaboard Air Line, all with offices at Norfolk, Va., has been extended over the Raleigh & Charleston and the Marion & Southern.

F. C. Regan has been appointed general agent of the traffic department of the Chicago & Alton, with office at Los Angeles, Cal., succeeding J. A. Fitzpatrick, resigned. J. H. Walkmeyer has been appointed commercial agent, with office at Buffalo, N. Y., in place of C. F. Vigor, resigned.

S. E. Burgess, district passenger agent of the Southern Railway at Richmond, Va., has been promoted to division passenger agent, with office at Richmond, and G. R. Pettit, district passenger agent at Jacksonville, Fla., has been promoted to division passenger agent, with office at Jacksonville.

G. A. Cartwright, division freight agent of the Atlanta, Birmingham & Atlantic, with office at Fitzgerald, Ga., has been appointed general agent, with office at Atlanta. R. H. McKay, commercial agent at Moultrie, succeeds Mr. Cartwright, and George Land, Jr., division freight agent at Atlanta, having resigned to accept service elsewhere, that office has been abolished.

L. E. Chalenor, whose appointment as freight traffic manager of the Seaboard Air Line, with headquarters at Norfolk, Va., has been announced in these columns, began railway work in 1882 at Boston, Mass., as a clerk in the New England office of the Missouri Pacific, and was subsequently contracting freight agent and then New England traveling agent of the same road at Boston. He was then appointed traveling freight agent of the Rome, Watertown & Ogdensburg, now a part of the New York Central Lines, and about a year later became chief clerk to the general freight agent of the Norfolk & Western at Roanoke, Va. He was then commercial agent of the same road at Pittsburgh, Pa., until June, 1899, and then for two years was general freight and passenger agent of the Ohio River Railroad at Parkersburg, W. Va. From August 1, 1901, to January of the following year he was division freight agent of its successor, the Baltimore & Ohio at Parkersburg. On January 1, 1902, he was appointed assistant general freight agent of the Seaboard Air Line at Savannah, Ga., and was later transferred in the same capacity to Norfolk, Va. He was promoted to general freight agent on July 1, 1909, which position he held at the time of his recent appointment as freight traffic manager of the same road, as above noted.

Engineering and Rolling Stock Officers.

The authority of W. L. Seddon, chief engineer, and A. J. Poole, superintendent of motive power, of the Seaboard Air Line with offices at Portsmouth, Va., has been extended over the Tampa Northern.

E. C. Hanse, general foreman of the Georgia & Florida at Douglas, Ga., has been appointed acting master mechanic, with headquarters at Douglas, succeeding J. F. Sheahan, master mechanic, resigned to accept service with another company.

C. P. Murdock has been appointed roadmaster of the First division of the Georgia & Florida, with headquarters at Nashville, Ga., and J. W. Buchanan, roadmaster, at Douglas, now has charge of the Second division, with headquarters at Vidalia.

A. L. Fillmore has been appointed master mechanic of the Northern district of the Minneapolis, St. Paul & Sault Ste. Marie, with office at Stevens Point, Wis.; A. V. Birch has been appointed master mechanic of the Southern district, and C. F. Gillaspy has been appointed traveling engineer of the Northern district.

J. M. Kinkead, supervisor of the Northern Central, at Baltimore, Md., has been appointed supervisor of the Pennsylvania Railroad, with office at Huntingdon, Pa., succeeding G. M. Ball, Jr., transferred. C. S. Hager, assistant supervisor at Freeport, has been appointed assistant supervisor with office at Earnest, succeeding H. P. Thomas, promoted. J. B. Baker, Jr., assistant supervisor at Watsontown, has been appointed assistant supervisor, with office at Newport, succeeding R. S. Stewart, transferred. N. A. Camera, assistant supervisor, at Tyrone, has been appointed assistant supervisor at Mifflin, succeeding E. C. Silvius, transferred, and M. J. Jones, assistant supervisor at Trafford, succeeds Mr. Camera. B. M. Frymire has been

appointed assistant supervisor at Cresson, succeeding E. L. Koch, transferred.

Purchasing Officers.

Clinton D. Baldwin has been appointed purchasing agent of the Bangor & Aroostook, with office at Milo Junction, Maine.

The authority of H. C. Macklin, purchasing agent of the Seaboard Air Line at Portsmouth, Va., has been extended over the Tampa Northern.

A. H. Young, traveling storekeeper of the St. Louis & San Francisco, has been appointed general storekeeper, with headquarters at Springfield, Mo., to succeed J. R. Mulroy, resigned.

OBITUARY.

J. J. White, who built the Liberty-White Railroad, died at McComb City, Miss., November 16, aged 84 years.

L. A. Mettice, lake grain agent of the Delaware, Lackawanna & Western, at Buffalo, N. Y., died on November 18.

W. N. Babcock, general western freight agent of the Delaware, Lackawanna & Western, with office at Chicago, died on November 14, at his home in Glencoe, Ill., at the age of 65.

Phineas P. Wright, who was assistant general manager of the Lake Shore & Michigan Southern, from 1892 until his retirement in 1904, and previous to that date was for over ten years general superintendent of the same road, died on November 14, of pneumonia at his home in Cleveland, Ohio, at the age of 88 years.

John R. Fanshawe, who was secretary of the Lehigh Valley from 1870 to 1903, died on November 19 at Plymouth Meeting, Pa. He was born in 1841 at Philadelphia, and graduated from the high school of his native town. He began railway work with the Beaver Meadow Railroad & Coal Company in 1862, and when that company was absorbed by the Lehigh Valley in 1864 he remained in the service of the latter company, of which he became secretary in 1870. He remained in that position until his retirement in February, 1903. He had also held various positions on subsidiary lines of the Lehigh Valley.

Martin H. Chamberlin, auditor of the Rutland Railroad for 13 years, died, on November 14, at his home in Rutland, Vt., of pneumonia after an illness of two weeks. He was born on July 12, 1861, at Bath, N. H., and was educated in the high school of his native town. At the age of 18 he began railway work with the Passumpsic Railroad, now a part of the Boston & Maine at Wells River, Vt. As telegraph operator he was frequently promoted during the first few years of his career. On November 1, 1885, he went to Laredo, Texas, to become relieving agent for the Mexican National. From November 1, 1885, to June 1, 1889, he was train despatcher, then until May 1, 1890, was cashier in the freight office at Laredo, of the same road. He next went to the City of Mexico and until February 10, 1893, was traveling auditor of the same road. He returned to Vermont in 1893, and was appointed traveling auditor of the Central Vermont. In January, 1899, he was made auditor of the Rutland Railroad at Rutland, which position he held at the time of his death. In May last, Mr. Chamberlin was appointed commissioner of public safety of the city of Rutland, and had held other offices in the city government, being one of Rutland's most highly respected citizens. He was also a member of the Transportation Club of New York.

M. H. Chamberlin.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

THE BOSTON & MAINE has ordered 50 locomotives from the Baldwin Locomotive Works.

THE MANCHESTER SAW MILLS has ordered 1 mogul locomotive from the Baldwin Locomotive Works.

THE PUGET SOUND & BAKER RIVER has ordered 1 ten-wheel locomotive from the Baldwin Locomotive Works.

THE MARYLAND STEEL COMPANY has ordered 1 six-wheel switching locomotive from the Baldwin Locomotive Works.

THE ST. CROIX TIMBER COMPANY has ordered 1 six-coupled double ender locomotive from the Baldwin Locomotive Works.

THE ALAN WOOD IRON & STEEL COMPANY has ordered 1 four-wheel switching locomotive from the Baldwin Locomotive Works.

THE WEATHERFORD, MINERAL WELLS & NORTHWESTERN has ordered 1 consolidation locomotive from the Baldwin Locomotive Works.

THE CALIFORNIA STATE BOARD OF HARBOR COMMISSIONERS has ordered 1 consolidation locomotive from the Baldwin Locomotive Works.

THE ELGIN, JOLIET & EASTERN, as mentioned in the *Railway Age Gazette* of October 18, has ordered 20 mikado locomotives from the American Locomotive Company. The general dimensions of these locomotives will be as follows:

GENERAL DIMENSIONS.

Simple or compound	Simple
Weight on drivers	225,500 lbs.
Total weight	302,000 lbs.
Cylinders	28 in. x 30 in.
Diameter of drivers	63 in.
Type of boiler	Wagon Top radial
Working steam pressure	185 lbs.
Heating surface, tubes	4,096 sq. ft.
Heating surface, firebox	263 sq. ft.
Heating surface, total	4,392 sq. ft.
Tubes, number	272
Tubes, outside diameter	2 in.
Tubes, length	21 ft.
Firebox, length	114 in.
Firebox, width	72 in.
Firebox, material and maker	Steel, American Locomotive Co.
Grate area	57 sq. ft.
Tank capacity for water	8,500 gals.
Coal capacity	15 tons

THE MISSOURI, KANSAS & TEXAS, as reported in the *Railway Age Gazette* of October 18, has ordered 40 simple mikado locomotives from the American Locomotive Company. Some of the principal dimensions and the special equipment of these locomotives will be as follows:

GENERAL DIMENSIONS.

Weight on drivers	217,300 lbs.
Total weight	285,300 lbs.
Diameter of cylinders	26½ in.
Stroke of pistons	30 in.
Diameter of drivers	61 in.
Working steam pressure	185 lbs.
Heating surface, total	3,628 sq. ft.
Firebox, length	115 in.
Firebox, width	72 in.
Grate area	57.5 ft.
Tank capacity for water	8,500 gal.
Coal capacity	14 tons

SPECIAL EQUIPMENT.

Axles	Cambria.
Bell ringer	Gollmar.
Brakes	Westinghouse.
Brake beams	Waycott.
Brake shoes	Streeter.
Brick arch	American.
Couplers	Janney.
Driving boxes	Cast steel.
Headlight	Pyle-National Electric.
Injector	Nathan.
Journal bearings	Hewitt.
Safety valve	Coale.
Sanding devices	Handlan.
Sight-feed lubricators	Nathan.
Springs	Railway Steel Spring Co.
Staying	Tate, Rome Special.
Steam gages	American.
Superheater	Schmidt.
Tires	Railway Steel Spring Co.
Tubes	Worth Bros.
Valve gear	Walschaert.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has ordered 5 Pacific type locomotives from the American Locomotive Com-

pany. These locomotives will be equipped with superheaters, will have 25 in. x 28 in. cylinders, 75 in. driving wheels, and in working order will weigh 258,000 lbs.

The Harbor Commissioners of Quebec have ordered 3 six-wheel switching locomotives from the Montreal Locomotive Works. The dimensions of the cylinders will be 19 in. x 26 in.; the diameter of the driving wheels will be 50 in., and the total weight in working order will be 120,000 lbs.

The Chicago & North Western has ordered 11 Pacific passenger locomotives, 15 mikado locomotives and 45 consolidation locomotives from the American Locomotive Company, in addition to the 29 switching locomotives ordered from the Baldwin Locomotive Works, as reported in the *Railway Age Gazette* of November 8. All of these locomotives will be equipped with superheaters.

The Chicago, St. Paul, Minneapolis & Omaha has ordered 10 mikado locomotives, 2 consolidation freight locomotives, 8 Pacific type locomotives and 10 ten-wheel freight locomotives from the American Locomotive Company, in addition to the 5 switching locomotives ordered from the Baldwin Locomotive Works, as reported in the *Railway Age Gazette* of November 8. With the exception of the mikados, all will be equipped with superheaters.

CAR BUILDING.

The Missouri Pacific is negotiating for 4,000 box cars.

The Coal & Coke is closing negotiations for 500 coal cars.

The International & Great Northern is in the market for 1,000 box cars.

Minneapolis, St. Paul & Sault Ste. Marie is in the market for 20 caboose cars.

The Westmoreland Coal Company, Philadelphia, Pa., is in the market for 100 coal cars.

The Illinois Central is in the market for 3,000 gondola cars, 1,000 box cars and 500 stock cars.

The Atlantic Coast Line is now in the market for 300 flat cars.

The Duluth & Iron Range and the Duluth Missabe & Northern are in the market jointly for 1,000 ore cars.

The Harriman Lines are said to have ordered 2,000 gondola cars from the Bettendorf Axle Company; this has not been confirmed. This company is negotiating for over 8,000 cars in addition to the gondola cars.

The Delaware, Lackawanna & Western has ordered 500 box cars, 500 gondola and 250 hopper cars from the American Car & Foundry Company, 250 hopper cars and 200 refrigerator cars from the Standard Steel Car Company, and 500 box cars from the Barney & Smith Car Company.

The Chicago, St. Paul, Minneapolis & Omaha has ordered 500 steel gondola cars and 500 forty-foot steel underframe box cars from the American Car & Foundry Company, and 2 sixty-foot steel baggage cars, 1 steel dining car and 2 seventy-foot compartment cars from the Pullman Company.

The Chicago & North Western, mentioned in the *Railway Age Gazette* of October 25, as closing contracts for cars, has ordered 1,000 forty-foot box cars of 80,000 lbs. capacity, 500 flat cars of 100,000 lbs. capacity, and 1,000 steel ore cars from the Pullman Company, and 1,500 forty-foot steel underframe box cars and 2,000 steel gondola cars from the American Car & Foundry Company; also 10 standard steel passenger cars, 23 sixty-foot steel baggage cars, 3 steel dining cars, 4 steel parlor cars and 2 dynamo-buffet cars from the Pullman Company, and 10 steel smoking cars from the American Car & Foundry Company.

IRON AND STEEL.

The Seaboard Air Line has ordered 5,000 tons of rails from the Pennsylvania Steel Company.

Supply Trade News.

Modjeski & Angier, civil engineers, opened a new office on November 15, at St. Louis, Mo., where the company will be represented by W. F. Randolph.

W. J. Black has been appointed general manager of the Brownell Improvement Co., Chicago, and A. H. Bannister has been appointed general superintendent.

The sales of the Westinghouse Air Brake Company, Pittsburgh, Pa., during August and September, the first two months of the fiscal year, exceeded those in the corresponding period of last year by 75 per cent.

Gove S. Taylor has been made a representative of the Magnolia Metal Company, New York, in the Pittsburgh district and surrounding territory. Mr. Taylor was formerly manager of the Peerless Rubber Manufacturing Company.

The Crane Company, Chicago, has concluded negotiations for the purchase of more than 100 acres of land at South Kedzie and Archer avenues to be used for a central plant, to cost about $7,000,000, and employ 6,000 men. It is proposed to bring together on one side the various separate units of the Crane Company which are now located in various parts of the city. Work on the new plant will be started early next year.

J. G. White & Co., Inc., New York, will segregate its engineering and managing departments and organize the J. G. White Engineering Corporation and the J. G. White Management Corporation. The J. G. White Engineering Corporation will take over all assets, of the engineering and construction department and will have a capitalization of $1,000,000 common stock and $1,000,000 7 per cent. preferred. All the common stock will be owned by J. G. White & Co., Inc.; $350,000 of the preferred stock will be offered at par to stockholders of the J. G. White & Co., Inc., up to 10 per cent. of their holdings with a 10 per cent. bonus of common stock of the latter company; $150,000 of the preferred stock will be offered to members of the board of directors of the new company. The J. G. White Management Corporation will have a capitalization of $500,000 common stock and $500,000 7 per cent. preferred stock. All the common stock will be issued to J. G. White & Co., Inc. The new company will take over all assets of the managing department. Of the preferred stock $350,000 will be offered to stockholders of J. G. White & Co., Inc., at par, up to 10 per cent. of their holdings with a bonus of 10 per cent. of common stock of J. G. White & Co., Inc. The remaining $150,000 will be offered to members of the board of directors of the new company. Under this plan each stockholder of J. G. White & Co., Inc., will be entitled to subscribe to one share of the preferred stock of each of the new companies for each ten shares of the stock, either common or preferred of J. G. White & Co., Inc. A meeting of the stockholders of J. G. White & Co., Inc., will be held December 10 to approve the plan of segregation and the organization of a new company. That the provision of additional working capital in the segregation plan is secondary is indicated by the showing that the total debts of the company are less than $58,000, while cash in bank, in working capital, and cash at branch offices is more than $276,000, with a surplus of $1,290,000. Payment for the stock of the new company is to be made 50 per cent. January 1, 1913, and 50 per cent. March 1, 1913. Subscribers may if they prefer pay in full on January 10, or thereafter up to March 1. Common stock of J. G. White & Co., Inc., given with the preferred stock will be issued upon payment of the final instalment for the new preferred issues. Quarterly dividends on the preferred stocks will accrue on February 1, 1913. The preferred stock may be redeemed in amounts of not less than $50,000 at any time at $115 a share and accrued dividends. With the segregation of the engineering and construction department and the management department, J. G. White & Co., Inc., will be left free to take up financing propositions and will continue its operations in that field.

The Maintenance of Way Master Painters' Association held its annual convention in Chicago on Tuesday, Wednesday and Thursday of this week. Abstracts of the different papers presented will be published in later issues.

Railway Construction.

ATLANTIC COAST LINE.—Train service has been extended on the Haines City branch of the Third division from Frost Proof, Fla., south to Sebring, 18.7 miles, and a new branch has been opened for business on this division from Florence Villa, Fla., to Niles, 5.4 miles.

BESSEMER & LAKE ERIE.—An officer writes that the company is building 3.7 miles of second track from Woods, Pa., to Culmerville.

BRINSON RAILWAY.—Work was started recently on an extension from Waynesboro, Ga., to St. Clair, 12 miles, where connection is to be made with the Georgia & Florida, and through a trackage arrangement on about 6 miles of that road, the Brinson Railway will secure an entrance into Augusta. (October 18, p. 774.)

CANADIAN NORTHERN.—According to press reports a contract has been given to Murdoch & Company, Vancouver, B. C., for work on 40 miles from the north end of Cowichan lake to the Alberni canal.

The line from Edmonton, Alta., north to Morinville has been extended north to Athabasca Landing, 72 miles.

CANADIAN PACIFIC.—This company has opened for business new lines as follows: Cabri subdivision from Java, Sask., north to Cabri, 35 miles. Waldo subdivision from Caithness, B. C., south to Waldo, 10 miles; and the Fort Steele subdivision from Colvalli, B. C., north to Fort Steele, 23 miles.

This company has bought over 1,000 acres of land, it is said, near St. John, New Brunswick, to be used for making a change in the route of one of the branches. The New Brunswick Southern, which was taken over by the Canadian Pacific two years ago, follows the coast and has its terminus at West St. John. The land which has been bought extends between the Canadian Pacific main line and the New Brunswick Southern and a line will probably be built connecting the two roads, giving the latter direct entrance to the union station in St. John. Car repair and construction shops will also be established on the land.

CENTRAL ONTARIO.—An officer writes that this company has some of the work finished on a line from Wallace, Ont., to Whitney, 12 miles.

CHARLESTON-ISLE OF PALMS TRACTION.—An officer writes that the plans call for building from Mount Pleasant, S. C., east via Sullivan's Island and the Isle of Palms to McClellanville, 36 miles. Connection is to be made from Mount Pleasant with Charleston by ferry. Contracts for grading, etc., are to be let after January 1, 1913. Some of the track has already been laid. There will be about a mile of concrete bridges on the line, including one of about 250 ft. The Isle of Palms Development Company will fill in an area of one-half square mile and construct about 10,000 cu. ft. of concrete retaining walls. About $50,000 will probably be spent for concrete work, including a new power house, new ferry wharf, and making other permanent improvements. The company expects to develop a traffic in passengers and freight, including lumber, dairy products, cotton, fruit, etc. James Sottile is president, and W. W. Fuller is chief engineer, New Charleston Hotel, Charleston.

CHICAGO, MILWAUKEE & ST. PAUL.—A contract has been awarded to the Walsh Construction Company for two million yards of excavation on double-track work between Muscatine, Iowa, and Ottumwa.

CONCORD & MONTREAL.—See Mount Washington Railway.

DENVER & RIO GRANDE.—The immediate construction of the double-track detour line over Soldier Summit, where the railroad crosses the Wasatch mountains in Utah has been authorized. The present line between Tucker and Soldier Summit is seven miles long and the grade 4 per cent. The new line between the same points will be 15 miles long with grade reduced to 2 per cent. The cost of this work will be about $3,000,000. Contracts will be let at once, and it is expected that the work will be completed by July, 1913.

See an item in General News.

DE QUEEN & EASTERN.—An officer writes that surveys have been made for building an extension from Dierks, Ark., northeast to Hot Springs, 60 miles.

DENVER NORTHWESTERN & PACIFIC.—According to press reports the Denver & Salt Lake Construction Company, with a capital of $1,000,000, is now being organized in Delaware, to build the D. N. W. & P. from Steamboat Springs, Colo., west about 62 miles towards Salt Lake City, Utah. A Colorado corporation is also being organized to be known as the Denver & Salt Lake Railway Company, to build the line to the Utah boundary, and eventually to Salt Lake City.

EDMONTON INTERURBAN.—An officer writes that a contract has been given to F. W. MacLeod, Edmonton, Alta., to build a section of this road from Edmonton. About four miles has been graded and the company expects to have seven miles completed this year, and to build 60 miles of extensions in 1913. The approximate cut and fill work averages 8,000 cu. yds. a mile. The maximum grade will be 4.2 per cent. George Barbey is president, Vancouver, B. C., and M. Kimpe is the engineer.

ELBERTON & EASTERN.—An officer writes that a contract has been given to J. F. Cogan & Co., New York, to build from Elberton, Ga., southeast to Tignall, 21 miles. An extension is also projected from Tignall east to Lincolnton, 18 miles. A. Wilson, chief engineer, Elberton.

ELK & LITTLE KANAWHA.—This road has been extended from Rosedale, W. Va., to Shock, 5 miles.

ELKIN & ALLEGHENY.—An officer writes that work is now under way on the extension from Thurmond, N. C., towards Sparta. The work is being done by the company using convict labor, and three miles of grading has been finished.

FORT SMITH, ARKOMA & WILBURTON.—An officer writes that a contract has been given to Burke Brothers, Fort Smith, Ark., to build from Fort Smith southwest to Wilburton, Okla., 60 miles. (March 22, p. 701.)

GRAND TRUNK PACIFIC.—The Prince Rupert line is now in operation from Prince Rupert, B. C., east to South Hazelton, 176.7 miles.

GREAT NORTHERN.—A section of the Fargo-Surrey line between Bedford, N. Dak., and Surrey, 185 miles, has been opened for business.

GULF, TEXAS & WESTERN.—An officer writes that this company has projected an extension from Seymour, Tex., to Crosbyton, or to Floydada, 100 miles.

HAMPDEN RAILROAD.—An officer writes that work is now under way building from a point on the Boston & Albany at Athol Junction, which is about two miles east of Springfield, Mass., to a connection with the Central Massachusetts division of the Boston & Maine at a point about two miles east of Bondsville, 14.82 miles. Plans have been made to build a branch from this line at a point near Bircham Bend to a connection with the Boston & Maine at Chicopee, 4.25 miles. Grading work on the main line is about nine-tenths finished, and track has been laid on about five miles. It is expected that the entire line will be ready for business in the spring of 1913. (November 1, p. 861.)

HUNTINGDON & HEMMINGFORD.—Application has been made in Quebec for incorporation to build from Huntingdon, Quebec, to Hemmingford. The provisional directors include H. Timmis, R. H. McMaster, R. H. Barron, Montreal; C. W. Taylor and A. R. McMaster, Westmount, Quebec.

ILLINOIS CENTRAL.—A contract has been given to the Bates & Rogers Construction Company, Chicago, for concrete work on track elevation at Memphis, Tenn., involving the construction of six subways and about 25,000 cu. yds. of concrete.

IOWA & SOUTHWESTERN.—This road is now open for business from Blanchard, Ia., to Clarinda, 17.5 miles.

KNOXVILLE, SEVIERVILLE & EASTERN.—See South Atlantic & Western.

LEXINGTON & EASTERN.—A new line called the Eastern division has been opened for business from Jackson, Ky., east to Whitesburg, 86.4 miles.

Liveoak, Perry & Gulf.—An officer writes that surveys are being made for carrying out grade and alinement improvements and putting in 11 miles of new rail from Liveoak, Fla., to mile post 33.

Mississippi Central.—An officer writes that surveys have been made for carrying out revision work on two miles of line near Sumrall, Miss.; also on two miles near Epley. During the past year the company has filled in a number of trestles on the present main line.

Mississippi River & Bonne Terre.—The Crawley branch from Flat River, Mo., to Esther, 1.6 miles, has been opened for both passenger and freight business.

Mount Washington Railway.—An officer writes that next year, under the name of the Concord & Montreal, an extension is to be built from the base to the summit of Mount Washington, N. H., 15.2 miles. The line is to use electricity for the motive power, and will eventually take the place of the present Mount Washington Railroad, which is now operated as a cog road.

Natchez, Columbia & Mobile.—An officer writes that a contract has been given to Bird & Bradshaw, Columbia, Miss., for work on 9 miles from a point beyond Jayess, Miss., to Tilton.

National Railways of Mexico.—An officer writes that work is now under way by the Cia Bancaria de Fomento y Bienes Raices de Mexico, S. A., Juan Phillits and Cia Constructora de Sombrete, all of Mexico City, Mex., on the extension from mile post 56 west of Durango to Llano Grande, seven miles; also from mile post 85 Durango east to Canitas, including a six mile branch to Sombrete, 87 miles.

Surveys are 60 per cent. finished for the new line from Vera Cruz via Tampico to Matamoras, with a branch to Mexico City, in all 685 miles.

Work is now under way from mile post 77 from Penjamo to Ajuno, eight miles, and from mile post 29 from Allende to San Carlos Hacienda, 23 miles, and from Tamos Junction, Cardenas division, six miles south of Tampico, south to mile post 62, on the Vera Cruz-Tampico Matamoras line, 62 miles. The contractors on this work are the Cia Bancaria de Fomento y Bienes Raices, de Mexico, S. A., and Gonzales Trevino Hnos Allende, Coahuila.

Surveys are now being made for a revision of line and change of gage from Mexico City to Acambaro, 165 miles.

The Vera Cruz & Isthmus has projected an extension of 31 miles.

Nazas Valley & Pacific.—Surveys are said to be made for building from Tepehuanes, Mexico, to Guanacevi, 70 miles. A. B. Meloy and J. T. Odell, New York, are said to be back of the project.

New Brunswick Southern.—See Canadian Pacific.

North Louisiana & Gulf.—An officer writes that work is now under way building an extension from New Friendship, La., to Bloyd, three miles.

Northern Pacific.—The report of this company for the year ended June 30, 1912, shows that work on the second main track ou 2.68 miles between St. Paul, Minn., and Minneapolis, and on the second main track and change of line and grade on 14.79 miles from St. Cloud to Rice's has been completed. The Cuyuna Northern, a branch line for handling ore from the Cuyuna range has been finished from Deerwood, Minn., south of the main line 3.81 miles, and another line about 5.25 miles is being built north of the main line. Tracklaying on 5 miles of second track is to be completed this fall from Bloom, N. Dak., to Jamestown. The branch from Pingree to Wilson, 92.5 miles, and 53 miles of the Missouri River Railway (Mandan North Line) has been finished; grading work on the Knife river line from Stanton on the Mandan North Line, west, is now being carried out. The Missouri River Railway from Glendive, Mont., northeatserly along Yellowstone river, 55 miles, has been finished, and the second main track work, and a change of line and grade of 12.63 miles, Huntley to Billings, has the grading tracklaying and culverts completed, bridges are 96 per cent. complete. The Camp Creek branch from Manhattan, Mont., to Anceney in the Gallatin valley, 15.15 miles, has been finished. The Clark's Fork to Oden grade, revision work on 7.62 miles in Idaho has been finished. Grade revision work from Moab, Wash., to Trent, 2.93 miles, has been completed except at Moab, where 90 per cent. is completed, and at Otis, where 80 per cent. Second main track has been laid from mile post 73 to Yardley, near Spokane, 7.9 miles. Between Weston, Wash., and Maywood, on the west slope of the Cascade mountains, the rising grade including necessary raises of bridges at first, third and fourth crossings of the Green river, to bring same above danger of high water, is about 70 per cent. finished. Contracts were let for the construction of the Point Defiance line from Tacoma, Wash., to Tenino, and work is now under way. From Tenino to Vancouver second main track, also line and grade changes has been completed with the exception of the Cowlitz river bridge, and some grading and track work which cannot be completed until the bridge is in place. An extension of the Gray's Harbor branch from Ocosta, Wash., to Bay City, 2.79 miles, has been completed, and work has been authorized on the Interbay-Ballad change of line and grade in the suburbs of Seattle. This involves the construction of a single track railway from Interbay to Tremont, with connection to Ballard, including a bascule bridge over Samon bay waterway. The work is deferred awaiting action of the United States government. A 2.36 mile spur along West Lake avenue, on the Lake Union Line, Seattle, is under construction and an extension of the Lake Union line has been authorized. Work is about 50 per cent. finished on the Pilchuck grade revision, and change of line about 2 miles. The Oregon Trunk, which is controlled by the Spokane, Portland & Seattle is finished to Bend, Ore., 156.5 miles from a connection with the main line of the S. P. & S. at Fallbridge, Wash., on the Columbia river. The extension of the Oregon Electric from Salem, Ore., to Albany, 26.7 miles, has been finished and is now in operation, and the extension from Albany to Eugene, 44.9 miles will be completed in 1912.

North Railway.—An officer writes that surveys are being made to build from Montreal, Que., to James Bay, 550 miles. C. L. Van Norden, assistant secretary, Canadian Express building, Montreal.

Oregon Electric.—The extension between Albany, Ore., and Eugene, 44.7 miles, has been opened for passenger service.

Piedmont & Northern Lines.—The Greenville, Spartanburg & Anderson, between Greenwood, S. C., Belton and Anderson, 41.3 miles, has been opened for business.

Quebec & North Eastern.—Application has been made in Quebec for incorporation to build from the western boundary of the province of Quebec near Oposatica lake, Pontiac county, northeasterly to the National Transcontinental (Grand Trunk Pacific) near Lake Kapitachuan, about 160 miles, with a branch from a point at the crossing of the Belle river of the National Transcontinental southeasterly via Mount Laurier, Three Rivers, and Grand Piles to Quebec, and another branch from Lake Temiskaming south via Ville Marie, thence northeasterly to Lac des Quinze or Lake Expanse. G. Parent, Quebec, is solicitor.

St Louis Southwestern.—President Britton is quoted as saying that this company will eventually build an extension to the Gulf of Mexico or to Houston, from which latter point trackage and terminal rights into Galveston could be secured. It will require 100 miles of new construction and will cost about $25,000 a mile to build.

San Antonio, Uvalde & Gulf.—The San Antonio division has been opened for business from San Antonio, Tex., south to Pleasanton, 34 miles.

Seaboard Air Line.—An officer writes that work is now under way by O. S. Lanier, Bartow, Fla., building an extension from Mulberry, Fla., to Bartow, about 8½ miles.

South Atlantic & Western.—Incorporated in North Carolina as a successor of the South Atlantic Transcontinental, with headquarters at Asheville. It is understood that the new company will carry out work on the line projected for some time from Knoxville, Tenn., east to Rutherfordton, N. C., where connection is to be made with the Seaboard Air Line, and that the Knoxville, Sevierville & Eastern, operating a 30-mile road from Vestal, Tenn., east to Sevierville, may form part of the through line. H. R. Nickerson is president, and J. L. Counsill is secretary.

SOUTH ATLANTIC TRANSCONTINENTAL.—See South Atlantic & Western.

SOUTHERN PACIFIC.—The Weed subdivision of the Shasta division has been extended from Chiloquin, Ore., to Kirk, 13.5 miles.

SOUTHERN PACIFIC OF MEXICO.—According to press reports work has been resumed on the section south of Tepic, Mex., towards Orendain. The section between La Quemada and Magdalena, in the state of Jalisco, has recently been opened for traffic.

SYDNEY & LOUISBURG.—An officer writes that the company is building a one mile extension from Summit, N. S., to Waterford Lake, and is making surveys for an additional extension of one mile from Waterford Lake to Victoria Mines.

TIDEWATER SOUTHERN.—This road has been extended from Bridge, Cal., north to Stockton, 25 miles.

VERA CRUZ & ISTHMUS.—See National Railways of Mexico.

RAILWAY STRUCTURES.

ALBANY, GA.—The Central of Georgia has given a contract to A. N. Walkut, Richmond, Va., it is said, for putting up a railway station at Albany to cost $50,000.

ATCHISON, KAN.—The Missouri Pacific has announced plans for improvements at its central branch shops to cost approximately $35,000, including a new twelve-stall roundhouse, blacksmith shop, boilerhouse, oilhouse, additional track facilities and other minor improvements.

BARNESVILLE, GA.—The Central of Georgia has given a contract to A. N. Walkut, Richmond, Va., it is said, to put up a brick passenger station at a cost of $14,000. (September 6, p. 454.)

CORPUS CHRISTI, TEX.—The San Antonio & Aransas Pass is preparing to erect a new passenger station to replace the building that was destroyed by fire some time ago.

PERU, IND.—The Wabash has prepared plans for a new two-story passenger station and office building.

ST. JOHN, N. B.—Bids are wanted up to December 2, by the provincial government for the erection of a combined highway and street railway bridge to connect East and West St. John. The bridge will cost over $300,000.

See Canadian Pacific under Railway Construction.

SUPERIOR, WIS.—Preliminary work has been started for a large ore dock to be built for the Northern Pacific of concrete and steel, 1,300 ft. long, 70 ft. wide and 80 ft. high, with a capacity of 60,000 tons of ore. The American Bridge Company has been awarded the contract for the steel construction, and bids have been asked for the other work.

VANCOUVER, B. C.—The report of the Northern Pacific for the year ended June 30, 1912, shows that during the past three years terminal property at Vancouver has been bought in the interest of the Northern Pacific and the Great Northern, and is now being developed. When the plans now under consideration are completed there will be a first class terminal for both freight and passenger business owned jointly by the two companies. New station buildings were put up during the year and increased facilities provided at a number of places in Minnesota, in North Dakota, in Montana, in the state of Washington, and in Oregon. During the year 175 bridges were replaced and 3 abandoned, 111 bridges, 19,234 ft. in length, were replaced by timber structures, and 7 permanent and 57 timber structures were replaced in permanent form, of these 46 were replaced by embankments and 18 were replaced by truss, girder, I-beam and reinforced concrete trestle, a total of 20,717 lineal feet, 119 timber culverts were rebuilt, 15 in temporary and 104 in permanent form. There are now under construction on operated lines 1,145 lineal feet of steel girder and I-beam spans; 870 lineal feet of steel truss spans; 1,408 lineal feet of reinforced concrete trestle; one 425-ft. double track steel draw span and one 191-ft. movable leaf bascule span; also one steel highway viaduct, 738 ft. long.

Railway Financial News.

BOSTON & ALBANY.—Lee, Higginson & Co. and Kissel, Kinnicutt & Co. have purchased and are offering at prices to yield about 4.58 per cent. $5,220,000 4½ per cent. equipment trust certificates of 1912. The total issue is $7,500,000 of which $2,280,000 is reserved for future use. These certificates were issued by the New York Central & Hudson River and the New York, New Haven & Hartford, and the proceeds will be used for the purchase of equipment for the Boston & Albany.

CANADA SOUTHERN.—This company has made a first and refunding mortgage to secure an issue of $40,000,000 consolidated 50-year 5 per cent. bonds guaranteed principal and interest by the Michigan Central. Of this authorized issue $22,500,000 will soon be issued to take up the $14,000,000 first mortgage 5 per cent. bonds due January 1, 1913; the $6,000,000 second mortgage 5 per cent. bonds due March 1, 1913; and to reimburse the Michigan Central for $2,500,000 advanced by that company for betterments and improvements to the Canada Southern.

CANADIAN PACIFIC.—An issue of $60,000,000 additional common stock was authorized at the last annual meeting of the stockholders. This stock will be offered to stockholders at $155 per share on a basis of 30 per cent. of their present holdings. Offerings will be made January 2, 1913, and the right to subscribe will expire February 13, 1913. Payments will be received in five instalments of 20 per cent. on or before each of the following dates: February 13, April 14, June 13, August 18 and October 20. Interest at 7 per cent. a year will be paid in October, 1913, from due date of each installment to September 30 on installments up to and including that of August 18. All the shares of the above issue on which installments have been paid will rank with existing stock for full dividends accruing for the quarter ending December 31, 1913.

DENVER RAILWAY SECURITIES COMPANY.—The Equitable Trust Company, New York, as trustee under the agreement dated May 1, 1911, securing the $3,500,000 6 per cent. notes due and unpaid May 1, 1912, will sell the following collateral thereunder at 14 Vesey street, New York, on December 11, this sale being pursuant to a power in that regard conferred upon the trustee by the trust agreement; collateral trust 6 per cent. gold notes of the Colorado-Utah Construction Company, dated 1909 and due May, 1911, $4,000,000; claim of the Equitable Trust Company against the estate of David H. Moffat as guarantor upon the notes of the Colorado-Utah Construction Company, filed in the county court of Denver and allowed by the court to the amount of $4,225,353. Over 98 per cent. of the $3,500,000 Denver Railway Securities Company 6 per cent. collateral trust notes have been deposited with the Bankers' Trust Company, New York, under the plan tentatively agreed to by the noteholders' committee and Newman Erb.

ERIE.—The New York Public Service Commission, Second district, has authorized this company to issue $2,000,000 equipment trust certificates.

LITTLE MIAMI.—This company has filed a new mortgage to secure an authorized issue of $10,000,000 bonds, under which $1,070,000 50-year 4 per cent. bonds have been issued to retire the first mortgage 5 per cent. bonds which matured November 2, 1912.

MICHIGAN CENTRAL.—See Canada Southern.

MISSOURI PACIFIC.—President Bush has informed his board of directors that he believes that the International & Great Northern should become an integral part of the Missouri Pacific-Iron Mountain system and under his advice the board of directors is negotiating for an option on the International & Great Western preferred and common stock holdings of the Jay Gould estate and Frank J. Gould. The Missouri Pacific Board has appointed a special committee, consisting of J. P. Metcalfe, E. D. Adams, and Edgar L. Marston, to make an investigation into the physical and financial condition of the International Great Northern.

NEW YORK CENTRAL & HUDSON RIVER.—See Boston & Albany.

NEW YORK, NEW HAVEN & HARTFORD.—See Boston & Albany.

[ADVERTISEMENT.]

ANNUAL REPORTS

NORTHERN PACIFIC RAILWAY COMPANY—SIXTEENTH ANNUAL REPORT.

OFFICE OF THE
NORTHERN PACIFIC RAILWAY COMPANY,
ST. PAUL, MINNESOTA.

September 16, 1912.

To the Stockholders of the
NORTHERN PACIFIC RAILWAY COMPANY.

The following, being the Sixteenth Annual Report, shows the result of the operation of your property for the fiscal year ending June 30, 1912.

INCOME ACCOUNT.

	1911.	1912.	Increase or Decrease.
REVENUE FROM TRANSPORTATION:			
Freight	$43,332,918.23	$43,793,521.58	$460,603.35
Passenger	17,278,812.52	15,343,752.05	—1,935,060.47
Other revenue from transportation	3,456,962.01	3,357,864.67	—99,097.34
Totals	$64,068,692.76	$62,495,138.30	—$1,573,554.46
REVENUE FROM OPERATION other than transportation	844,139.13	928,808.32	84,669.19
Total operating revenue	$64,912,831.89	$63,423,946.62	—$1,488,885.27
Per mile (average)	$10,908.93	$10,526.64	—$382.29
OPERATING EXPENSES:			
Maintenance of way and structures	$8,065,462.47	$7,861,490.57	—$203,971.90
Maintenance of equipment	7,911,231.46	7,207,716.49	—703,514.97
Traffic expenses	1,127,233.05	1,202,292.65	75,059.60
Transportation expenses	21,601,477.48	20,756,386.75	—845,090.73
General expenses	1,024,356.05	1,130,630.56	106,274.51
Totals	$39,729,760.51	$38,158,517.02	—$1,571,243.49
Per mile (average)	$6,676.79	$6,333.27	—$343.52
Net operating revenue	$25,183,071.38	$25,265,429.60	$82,358.22
Per mile (average)	$4,232.14	$4,193.37	—$38.77
OUTSIDE OPERATIONS:			
Sleeping, parlor, observation, dining and cafe cars and restaurants	$441,802.83	$312,750.94	—$129,051.89
Total net revenue	$25,624,874.21	$25,578,180.54	—$46,693.67
TAXES ACCRUED	$3,296,797.49	$3,739,079.37	$442,281.88
Per mile (average)	$554.04	$620.58	$66.54
Operating income	$22,328,076.72	$21,839,101.17	—$488,975.55
OTHER INCOME:			
Dividends and interest on securities, interest on deposits and miscellaneous	$2,705,981.83	$2,299,856.67	—$406,125.16
Rentals received	2,027,352.75	2,116,171.16	88,818.41
Hire of equipment	607,094.46	615,815.58	8,721.12
Gross income	$27,668,505.76	$26,870,944.58	—$797,561.18
DEDUCT:			
Rentals paid	$561,149.26	$526,319.96	—$34,829.30
Interest on funded debt	6,665,090.00	6,680,810.00	15,720.00
Dividends on stock	17,360,000.00	17,360,000.00	.....
Totals	$24,586,239.26	$24,567,129.96	—$19,109.30
Net income for the year	$3,082,266.50	$2,303,814.62	—$778,451.88
Ratio of operating expenses to total operating revenue	61.20%	60.16%	—1.04%
Ratio of taxes to total operating revenue	5.08%	5.90%	.82%

MILEAGE OPERATED.

Changes have taken place in the mileage operated during the year as follows:

		Miles
There were added:		
Aug. 14, 1911.	Gray's Harbor Branch in Washington, extension	2.74
Jan. 20, 1912.	Camp Creek Railway in Montana, constructed	15.15
Mar. 1, 1912.	Miller Branch in Minnesota, extension	.14
	Total additions	18.03
Deductions:		
Sept. 1, 1911.	Main line in Minnesota shortened	.43
Nov. 1, 1911.	Rocky Fork Branch in Montana shortened	.13
Mar. 1, 1912.	Main Line in Washington shortened	.79
Mar. 31, 1912.	Oregon-Washington R. R. & Nav. Co. in Washington, leased, shortened	1.10
May 1, 1912.	Red Mountain Branch in Montana shortened	.14
June 30, 1912.	Corrections in rechaining	.57
	Total deductions	3.16
	Net additions	14.87
	Mileage operated June 30, 1911	6,016.92
	Mileage operated June 30, 1912	6,031.79
	Average mileage operated during the year	6.025.09

EARNINGS.

FREIGHT BUSINESS.

Freight revenue was $43,793,521.58, an increase of $460,603.35 or 1.06 per cent over the previous year.

5,051,181,481 tons of revenue freight were moved one mile, an increase of 250,515,455 tons one mile, or 5.22 per cent over the previous year.

The rate per ton mile decreased from .00903 to .00867.

The revenue train load increased from 461.45 to 510.54 tons. The total train load, including company freight, increased from 553.12 to 593.78 tons.

The number of miles run by revenue freight trains was 9,296,541, a decrease of 475,172 or 4.86 per cent.

PASSENGER BUSINESS.

Passenger revenue was $15,343,752.05, a decrease of $1,935,060.47, or 11.20 per cent from the previous year.

Mail revenue was $981,528.33, an increase of $1,292.51 or 0.13 per cent.

Express revenue was $1,283,352.39, a decrease of $125,768.02 or 8.93 per cent.

Excess baggage and miscellaneous passenger revenue was $281,610.88, a decrease of $16,974.86 or 5.69 per cent.

Total revenue for persons and property carried on passenger trains was $17,890,243.65, a decrease of $2,076,510.84 or 10.40 per cent from the previous year.

The number of passengers carried was 8,661,645, a decrease of 601,208 from the previous year, and the number of passengers carried one mile was 649,508,183, a decrease of 109,767,876 or 14.46 per cent.

The number of miles run by revenue passenger trains was 11,355,464, a decrease of 24,891 or 0.22 per cent.

The rate per passenger per mile was .02362 and .02276 last year.

OPERATING EXPENSES.

CONDUCTING TRANSPORTATION.

The charges for transportation expenses were $20,756,386.75, a decrease of $845,090.73, or 3.91 per cent.

MAINTENANCE OF EQUIPMENT.

The charges for maintenance of equipment were $7,207,716.49, a decrease of $703,514.97, or 8.89 per cent.

LOCOMOTIVES.

Total number of usable locomotives June 30, 1911		1,441
Deductions:		
Sold	6	
Dismantled	19	
		25
Total number of usable locomotives June 30, 1912		1,416
In addition to these there are held for sale		17
Total locomotives owned		1,433

NOTE.—Of the 26 engines held for sale June 30, 1911, 9 were dismantled during the year, leaving 17 held for sale as above.

HAULING CAPACITY.

Active List.	Number.	Tractive Power (Pounds.)	Total Weight on Drivers. (Pounds.)	Total Weight of Engines. (Pounds.)
Assignment June 30, 1911.	1,441	44,276,900	199,985,138	253,791,988
Added during fiscal year*	.....	7,100	22,500	59,000
Total	1,441	44,284,000	200,007,638	253,732,998
Sold and dismantled	25	384,100	1,817,850	2,315,400
Total	1,416	43,899,900	198,189,788	251,417,598

*Account compound engines changed to simple.

The following statement shows the character and condition of the locomotives of the company on June 30, 1912.

Wheel Arrangement.	Owned June 30, 1911.	Condemned, Destroyed, and Sold.	Added.	Owned June 30, 1912.	Average Weight of Locomotive without tender. Tons of 2000 lbs. Total.	Average Weight of Locomotive without tender. Tons of 2000 lbs. On Drivers.	Tractive Force—Lbs.
○○ ◺	2	...	...	2	24.37	22.75	8,100
○○○ ◺	204	9	...	195	61.73	61.73	25,866
○○○○ ◺	9	...	...	9	68.50	68.50	26,500
○○○◺	189	1	...	188	53.42	44.38	18,166
○○○○◺	143	1	...	142	88.97	79.36	37,491
○○○○○◺	2	...	...	2	72.51	65.27	34,800
○○○◺	124	21	...	103	45.14	28.69	13,902
○○○○◺	291	2	...	289	79.36	59.51	26,152
○○○○○◺	4	...	...	4	99.00	75.00	38,500
○○○○◺	6	...	...	6	84.39	43.85	21,550
○○○○○◺	142	...	...	142	112.76	71.34	31,517
○○○○◺	150	...	...	150	102.25	76.75	33,300
○○○○○◺	220	...	...	220	130.23	101.73	46,336
○○○○-○○○◺	22	...	...	22	170.70	150.72	64,936
○○○○○-○○○○◺	5	...	...	5	218.98	201.90	80,500
Geared locomotives	4	..	...	4	63.32	63.32	29,250
Total	1,467	34	...	1,433	88.22	65.98	30,791

Condition.	Number.	Per Cent.
Good	1,124	78.44
Fair	189	13.19
At shops	120	8.37
	1,433	100.
Number of oil burning locomotives	21	1.47
Number of locomotives equipped with superheaters	99	6.91

PASSENGER EQUIPMENT.

There was no change in the number of passenger train cars owned during the year, viz.: 1,161 cars including 130 sleeping cars owned jointly with the Pullman Company. The number and kind of cars owned is shown in table on page 43.

On June 30, 1912, of the 1,161 cars owned, 837 cars were not due in shops for two months or more.

FREIGHT EQUIPMENT.

Comparative number and capacity of freight cars:

	1911.		1912.		Increase or Decrease.	
	Number.	Capacity. (Tons of 2000 lbs.)	Number.	Capacity. (Tons of 2000 lbs.)	Number.	Capacity. (Tons of 2000 lbs.)
Box	23,787	865,700	23,846	873,685	59	7,985
Furniture	594	18,670	565	17,900	*29*	*770*
Refrigerator	1,566	41,425	1,553	41,125	*13*	*300*
Stock	2,579	58,095	2,562	57,715	*17*	*380*
Flat	8,400	288,555	8,230	284,700	*170*	*3,855*
Oil	18	475	17	455	*1*	*20*
Coal	5,353	229,655	5,651	251,610	298	21,955
Ballast and Ore	803	32,120	796	31,840	*7*	*280*
Totals	43,100	1,534,695	43,220	1,559,030	120	24,335
Percentage					.28%	1.59%
Average capacity per car		35.6		36.1		

NOTE.—Figures in italics denote decrease.

Of the total number of freight cars on the road on June 30, 1912, only 1,688 or 3.90 per cent. were in need of repairs costing $5.00 or more per car.

In addition to equipment shown as on hand June 30, 1912, the following have been purchased or will be built at Company's shops during the current year and will be delivered this autumn:

LOCOMOTIVES.		
Six wheel switching locomotives		10
PASSENGER TRAIN CARS.		
Passenger refrigerator cars		13
FREIGHT TRAIN CARS.		
Box cars, 40 ton capacity (Company shops)	84	
Box cars, 40 ton capacity	1,500	
Refrigerator cars	1,500	
Gondolas, 50 ton capacity	16	
Automobile cars	300	
Tank cars, 8,000 gallon capacity	50	
Tank cars, 12,000 gallon capacity	10	
Ore cars, 35 ton capacity (second hand)	60	
		3,520

DEPRECIATION OF EQUIPMENT.

In accordance with the rules of the Interstate Commerce Commission the following amounts have been charged to operating expenses on account of estimated depreciation of equipment, viz.:

Locomotives	$387,070.55	
Passenger cars	110,149.88	
Freight cars	516,024.60	
Work cars	21,279.16	
Floating equipment	Credit *3,158.59*	
		$1,031,365.60

MAINTENANCE OF WAY AND STRUCTURES.

The charges for Maintenance of Way and Structures were $7,861,490.57, a decrease of $203,971.90 or 2.53 per cent.

The table in the report of the Comptroller, page 32, shows the distribution of this decrease under the respective accounts.

The following statements give particulars of the work done and show that the property has been well maintained.

PERMANENT WAY.

	1911.	1912.
New second track laid with 85 pound rail...miles	6.76	15.79
New second track laid with 90 pound rail... "	54.59	29.40
New second track laid with 72 pound rail... "	2.64	.....
New third track laid with 72 pound rail... "	1.38	1.06
New branch lines laid with 90 pound rail... "	12.26	.....
New branch lines laid with 72 pound rail... "	188.69	15.15
New branch lines laid with 56 and 60 pound rail. "	2.57	2.74
Main line relaid with 90 pound rail... "	136.68	102.38
Main line relaid with 85 pound rail... "	.....	2.92
Main line relaid with 66, 72 and 85 pound rail... "	22.97	6.89
Second track relaid with 90 pound rail... "	10.80	2.00
Second track relaid with 85 pound rail... "	1.35	.....
Branch lines relaid with 90 pound rail... "	6.61	.....
Branch lines relaid with 66, 72 and 85 pound rail. "	100.45	164.58
Sidings and spurs constructed... "	48.11	40.79
Track ballasted ... "	341.51	457.49
Embankment widened ... "	161.34	130.03
Cross tie renewals, main line...Ties	1,955,840	1,845,781
Cross tie renewals, branch lines... "	1,274,472	1,034,312
Timber bridges replaced by permanent structures and embankments, 57 in number, equal to...miles	2.14	3.89
Timber bridges renewed ...	72	111
Timber culverts replaced ...	107	119
New stock fence constructed...miles	78.56	102.62
New snow fence constructed... "	30.82	10.82

RAIL IN MAIN, SECOND, AND THIRD TRACKS.

	Miles	
	1911.	1912.
90-pound steel	1,108.62	1,236.78
85-pound steel	1,999.74	1,943.32
80-pound steel	2.52	2.26
76-pound steel	5.14	5.14
72-pound steel	732.57	901.68
70-pound steel	41.02	41.02
66 and 67-pound steel	629.75	607.93
60-pound steel	214.71	207.42
56-pound steel	1,695.66	1,549.69
Other weights	10.92	11.10
	6,440.65	6,506.34

BRIDGES.

During the year, 175 bridges were replaced and 3 abandoned. 111 bridges 19,234 feet in length were replaced by timber structures, and 7 permanent and 57 timber structures were replaced in permanent form, as follows:

Replaced by embankment	46 bridges, 18,819 lineal feet
Replaced by truss, girder, I-beam and reinforced concrete trestle	18 bridges, 1,898 lineal feet
Total	64 bridges, 20,717 lineal feet

119 timber culverts were rebuilt; 15 in temporary and 104 in permanent form.

There are now under construction on operated lines 1,145 lineal feet of steel girder and I-beam spans; 870 lineal feet of steel truss spans; 1,408 lineal feet of reinforced concrete trestle; one 425-foot double track steel draw span and one 191 foot movable leaf bascule span; also one steel highway viaduct 738 feet long.

BRIDGES AS THEY EXISTED JUNE 30, 1912.

	Aggregate Length		
	No.	Lineal Feet.	Miles.
Steel, iron, stone and concrete permanent bridges...	602	98,524	18.66
Timber, and combination iron and timber structures.	2,738	418,007	79.16
Totals	3,340	516,531	97.82

Total length of timber structures replaced by steel bridges, embankment, or in other permanent form, from July 1st, 1885, when work was commenced, to June 30th, 1912, has been 124.16 miles.

STATION BUILDINGS.

New buildings and structures, or increased facilities, have been provided at the following stations:

Minnesota.
St. Paul
Little Falls
Fergus Falls
Mooreton
Fertile
Joliette

North Dakota.
Fargo
Cannon Ball
Elgin
New Leipzig
Beach
Mandan

Montana
Myers
Bull Mountain
Grey Cliff
Clarkston
Willow Creek
Sappington
Butte
Edgar
Fromberg
Chadbourn
Amsterdam
Anceny
Pony
Perma
Hall
Miles City
Bozeman

Washington.
Centralia
Chehalis
Winlock
Kelso
Castle Rock
Otis
Cosmopolis
Kirkland
Snohomish
Auburn
Seattle
Sumner

Oregon.
Deer Island

SHOPS, ENGINE FACILITIES AND YARDS.

Buildings, tracks, turntables, or increased facilities have been provided at the following points:

Minnesota.
Northtown
Staples

North Dakota.
Jamestown
Wahpeton
Leeds

Idaho
Wallace

Washington.
Pasco
Parkwater
Auburn
Centralia
Elma
Easton
McCleary
Lester

FUEL STATIONS.

Additional or increased facilities have been provided at the following points:

Montana.
Zero

Washington.
Pasco
Parkwater
Auburn
Centralia

WATER SUPPLY.

Additional or increased facilities have been provided at the following points.

Minnesota.
Hinckley
White Bear
Lincoln
Ulen

North Dakota.
Mercer
Belfield

Montana.
Wibaux
Zero
Lombard
Amsterdam

Washington.
Pasco
Parkwater
Auburn
Ellensburg
Lester
Castle Rock
Sopenah

BLOCK SIGNALS AND INTERLOCKING PLANTS.

Interlocking plants have been installed and placed in service at the following points:

Minnesota.
St. Paul
Rice's

Washington.
Ballard

On June 30, on 2,485 miles of important main line there were 441.40 miles protected by automatic block signals and 917.30 miles protected by manual block.

DOCKS AND WHARVES.

Seattle, Washington. Remodeling of Pier No. 1, and warehouse providing freight room, waiting room and offices has been finished.

CHARGES TO CAPITAL ACCOUNT.

Upon requisition of the Executive Officers, approved by the Board of Directors, expenditures have been made during the past fiscal year for:

REAL ESTATE, RIGHT OF WAY AND TERMINALS:

At Superior, Wisconsin, real estate	$2,188.81
St. Paul, Minnesota, real estate	1,638.94
Minneapolis, Minnesota, real estate (Credit)	4,769.11
	(Cr.) $941.36

BRANCHES, LINE CHANGES, GRADE REVISIONS AND SECOND MAIN TRACK:

One third interest in double track line Vancouver to North Portland, including bridges over Columbia and Willamette Rivers. (Two thirds owned by Spokane, Portland & Seattle Railway Co.)	$482.84	
Edgeley-Missouri River line, North Dakota.	21,957.12	
Pingree West line, North Dakota	906,695.48	
Bitter Root Branch, extension, Montana	675.67	
Spokane, Washington, grade separation	4,069.91	
Point Defiance Line, Tacoma to Tenino, Washington	632,218.89	
Ocosta Branch, extension, Washington	48,103.01	
Orting Branch, extension, Washington	111,302.62	
Rights of way at Seattle, Washington, for change of line and new tracks	138,883.91	
Sundry surveys and expenses	3,202.41	
St. Cloud to Rice's, Minnesota, second main track	86,888.24	
Philbrook to Staples, Minnesota, second main track (Credit)	*345.34*	
Bloom to Jamestown, North Dakota, second main track	9,854.66	
Huntley to Billings, Montana, second main track	6,453.52	
Billings to Laurel, Montana, second main track	3,727.04	
Livingston to Muir, Montana, second main track	117.25	
M. P. 73 to Yardley (Spokane), Washington, second main track	110,352.45	
Tenino to Kalama, Washington, grade revision and double track	743,687.61	
Kalama to Vancouver, Washington, grade revision and double track	9,144.89	
North Portland to Portland City Limits, Oregon, grade revision and double track	1,530.05	
Sundry double track adjustments in Montana (Credit)	*24,362.00*	
		$2,806,640.23

ADDITIONS AND BETTERMENTS:

Right of way and station grounds	$158,368.99	
Widening cuts and fills	49,132.10	
Protection of banks and drainage	46,756.33	
Grade reduction and change of line	118,378.03	
Tunnel improvements	3,427.08	
Bridges, trestles and culverts	451,881.60	
Increased weight of rail	162,881.00	
Improved frogs and switches	9,255.66	
Track fastenings and appurtenances	356,115.86	
Ballast	179,383.98	
Additional main tracks	63,964.23	
Sidings and spur tracks	247,127.41	
Terminal yards	604,107.89	
Fencing right of way	2,631.81	
Improvement of crossings, under and over grade	29.56	
Elimination of grade crossings	67,853.56	
Interlocking apparatus	7,479.47	
Block and other signal apparatus	2,836.29	
Telegraph and telephone lines	48,961.01	
Station buildings and fixtures	291,934.01	
Shops, engine houses and turntables	356,313.91	
Shop machinery and tools	61,092.13	
Water and fuel stations	124,246.62	
Dock and wharf property	81,545.03	
Snow and sand fences and snowsheds	3,888.03	
Other additions and betterments	10,338.07	
		3,509,929.66

NEW EQUIPMENT:	*Total Expenditure.*	*Less used from Reserve.*	*Charged Capital.*	
Locomotives	$21,848.60	$95,358.85	(Cr.) *$73,510.25*	
Passenger train cars	77,955.07	31,548.68	46,406.39	
Fr'ght train cars and work cars	1,089,960.66	288,213.45	801,747.21	
	$1,189,764.33	$415,120.98		774,643.35
Total for the year				$7,090,271.88

In addition to the above amount added to the cost of the Northern Pacific Estate, advances have been made during the year to sundry companies as follows:

Midland Railway Company of Manitoba	$371,136.18
Clearwater Short Line Railway Company	23,302.73
Missouri River Railway Company	455,424.68
Western Dakota Railway Company	119,554.23
Connell Northern Railway Company (Credit)	*199,147.79*
Shields River Valley Railway Company	11.70
Camp Creek Railway Company	164,761.54
Cuyuna Northern Railway Company	40,152.02
Northern Pacific Terminal Co. of Oregon, account of Sinking Fund	36,792.99
Advances account of sundry surveys and rights of way	123,616.51
Total	$1,135,604.79
Less—	
Amount advanced in 1910 for "Railway Development in Oregon" credited*	5,000,000.00
Net reduction during the year	$3,864,395.21

*In 1910 an amount of $5,000,000 was charged to "Advances" for "Railway Development in Oregon." The respective properties benefited thereby having been charged direct, in the intervening time, with the actual amounts applicable thereto, the amount charged as above stated is now credited, leaving a reduction for the year in the Balance sheet account "Advances to proprietary, affiliated and controlled companies" of $3,864,395.21 as above stated.

RESERVE FOR ACCRUED DEPRECIATION OF EQUIPMENT.

Credit balance, reserve for accrued depreciation June 30, 1911			$10,089,366.86
Credits during year ending June 30, 1912:			
From charges to operating expenses and outside operations:			
Maintenance of equipment, depreciation	$1,031,365.60		
Maintenance of equipment, renewals	80,906.18		
Outside operations, depreciations	60,671.08		
From salvage	212,160.44		
From equipment sold	142,450.15		
			$1,527,553.45
			$11,616,920.31
Less equipment retired:			
Locomotives	$95,358.85		
Passenger cars	31,548.68		
Freight cars	230,529.12		
Miscellaneous equipment	57,684.33		
			415,120.98
Credit balance June 30, 1912			$11,201,799.33

CAPITAL STOCK AND DEBT.

There has been no change in the amount of capital stock outstanding during the year, viz.: $248,000,000.

Changes in Bonded Debt were as follows:

Prior Lien bonds issued under Article One, Section 4 of Mortgage	$1,500,000
Deduct Prior Lien bonds purchased and cancelled under Article Eight, Section 2 of Mortgage	460,000
Increase in bonded debt	$1,040,000

During the year bonds held as Treasury Securities were sold to provide funds for general construction purposes—

Prior Lien bonds	$2,500,000
Northern Pacific-Great Northern Joint 4's	300,000
C. B. & Q. General Mortgage 4's	1,550,000
Southern Pacific First Refunding 4's	429,000
	$4,779,000

SPOKANE, PORTLAND & SEATTLE RAILWAY COMPANY.

The results of the operation of the Spokane, Portland & Seattle road (including the Astoria & Columbia River R. R., merged March 1, 1911) for the years ending June 30, 1911 and 1912 were:

	1911 *550.95 Miles Operated*	*1912* *555.86 Miles Operated*
Operating revenue	$5,453,459.14	$4,814,560.85
Operating expenses	2,662,122.37	2,476,258.23
Net operating revenue	$2,791,336.77	$2,338,302.62
Outside operations	5,729.37	13,094.42
Total net revenue	$2,797,066.14	$2,351,397.04
Less taxes	470,300.00	527,404.78
Operating income	$2,326,766.14	$1,823,992.26
Other income (rents, etc., received)	726,528.22	1,104,451.97
Gross income	$3,053,294.36	$2,928,444.23
Rents, interest, hire of equipment, etc.	399,879.75	813,331.37
Balance	$2,653,414.61	$2,115,112.86

The gross earnings of this company on business exchanged with the Northern Pacific Railway Company for the fiscal year approximated $1,676,000.

OREGON TRUNK RAILWAY.

This road is finished to Bend, Oregon, 156.5 miles, from a connection with the main line of the Spokane, Portland & Seattle Railway at Fallbridge, Washington, on the Columbia River

Contracts permitting the Oregon-Washington Railroad & Navigation Company to use the tracks of the Oregon Trunk Railway from North Junction to South Junction, 11 miles, and from Metolius to Bend, 41 miles, a total of 52 miles, and the terminals at Metolius and Bend, have been executed, and joint freight and passenger service was inaugurated November 1, 1911.

OREGON ELECTRIC RAILWAY COMPANY.

The results of the operation of this property for the year as given below, compared with the previous year were:

	1911 *71.68 Miles Operated*	*1912* *72.81 Miles Operated*
Operating revenue	$616,079.79	$787,476.09
Operating expenses	323,512.28	480,533.28
Net operating revenue	$292,567.51	$306,942.81
Less taxes	30,403.03	47,440.10
Operating income	$262,164.48	$259,502.71
Miscellaneous income	5,239.62	4,277.75
Gross income	$267,404.10	$263,780.46
Interest on bonds and notes	100,000.00	116,483.06
Balance	$167,404.10	$147,297.40

The extension of the road from Salem to Albany, 26.7 miles, was completed and put into operation on July 4, 1912.

The extension from Albany to Eugene, 44.9 miles, will be completed in the autumn of 1912.

The United Railways Company and the Pacific Eastern Railway are operating the same mileage as shown in the last annual report.

All the properties mentioned on this page are controlled and managed by the Spokane, Portland & Seattle Railway Company, the securities of which are owned one half by your company and one half by the Great Northern Railway Company.

THE MIDLAND RAILWAY COMPANY OF MANITOBA.

The securities of this Company are owned one-half by your Company and one-half by the Great Northern Railway Company. The Company owns valuable real estate and terminal property in Winnipeg, which have been developed during the past year by the construction of a freight house, team tracks, freight yards, roundhouse and other facilities.

Contracts are now under discussion with the Canadian Northern Railway Company for the right to use the line of that Company from Pembina (a station on the Northern Pacific on the Canadian boundary), to Winnipeg, and their passenger terminal facilities at Winnipeg.

Up to June 30, 1912, there has been advanced to the Midland Company $3,027,272.36, one-half of which, $1,513,636.18, has been advanced by your Company, and which is carried in the balance sheet under the head of Advances to Proprietary Companies.

VANCOUVER, BRITISH COLUMBIA.

During the past three years terminal property at Vancouver has been purchased in the interest of the Northern Pacific Railway and the Great Northern Railway and is now being developed. When the plans now under consideration are completed there will be a first-class terminal for both freight and passenger business, owned jointly by the two companies named.

The Northern Pacific Railway up to June 30, 1912, has advanced $1,095,831.84, as its share of the enterprise, which amount is carried on the books under the head of Miscellaneous Investments.

With the completion of the plans for obtaining better facilities at Vancouver and at Winnipeg, your Company will be in a much better position to participate in the growing business moving between these important Canadian cities and the United States.

NEW LINES, DOUBLE TRACK, GRADE REVISIONS AND LINE CHANGES.

MINNESOTA.

Between St. Paul and Minneapolis, Line "B," Second Main Track, 2.68 Miles.

At time of last annual report this improvement was completed with the exception of steel work on Como and Bayless Avenue bridges, which has now been done.

St. Cloud to Rice's, Second Main Track, Line and Grade Change, 14.79 miles.

At time of last report this improvement was completed except track laying and the Little Rock Creek bridge, which has now been done.

Cuyuna Northern Railway.

A branch line for handling ore from the Cuyuna Range (3.81 miles long, with sidings 0.40 miles) running south of the main line of the Northern Pacific Railway from Deerwood, Minnesota, was begun in the latter part of September and completed in December, 1911, with the exception of some surfacing which was completed in the spring of 1912.

Another line about 5.25 miles long is at present being constructed north of the main line.

DAKOTA.

Bloom to Jamestown, Second Main Track, 4.99 miles.

At the time of last report this work was completed except track laying which will be finished this autumn.

Pingree to Wilton, 92.5 miles.

This branch was completed and turned over to the Operating Department August 1, 1912.

Missouri River Railway (Mandan North Line), 53 miles.

This line was completed and turned over to the Operating Department August 1, 1912.

Grading for the Knife River Line, extending from Stanton on the Mandan North Line westwardly is now being done. This line will serve a good wheat country.

MONTANA.

Missouri River Railway (Glendive East Line) from Glendive Northeasterly along Yellowstone River, 55 miles.

Line completed and turned over to Operating Department August 1, 1912. There is a very good grain crop in the country tributary to this line.

Huntley to Billings, Second Main Track, Line and Grade Changes, 12.63 miles.

Grading, track laying and culverts are completed, bridges are 96 per cent complete, and ballasting 99 per cent complete.

Camp Creek Railway.

A branch line extending from Manhattan to Anceney in the Gallatin Valley (15.15 miles main line and 1.32 miles sidings) was begun in July and completed in November, 1911.

IDAHO.

Clark's Fork to Oden, Grade Revision, 7.62 miles

This work has been completed.

Cocolalla Line Change, 0.8 mile.

This work has been completed.

WASHINGTON.

Moab to Trent, Grade Revision, 2.93 miles.

Minor grade revisions have been completed, except at Moab where 90 per cent is completed, and at Otis 80 per cent.

Mile Post 73 to Yardley, near Spokane, Second Main Track, 7.9 miles.

This work is completed.

Between Weston and Maywood (on west slope of Cascade Mountains).

Raising grade, including necessary raises of bridges at first, third and fourth crossings of Green River to bring same above danger of high water, about 70 per cent of this work has been completed.

Wilkeson Branch.

A change of line 0.9 miles in length between Melmont and Fairfax, to obviate the danger of washouts and provide better facilities for the lumber industries near Fairfax, has been authorized and is under construction.

Point Defiance Line, Tacoma to Tenino.

Contracts were let for the construction of this line early in the year, and the work is progressing satisfactorily.

Tenino to Vancouver, Second Main Track, Line and Grade Changes.

This work has been completed with the exception of the erection of the Cowlitz River Bridge, and some grading and track work which cannot be completed until the bridge is in place. Work on the bridge is in progress and should be finished early in the fall.

Gray's Harbor Branch, Ocosta to Bay City.

An extension of 2.74 miles of this branch has been completed and turned over for operation.

Interbay-Ballard (Suburbs of Seattle), Change of Line and Grade.

The construction of a single track railway from Interbay to Fremont, with connections to Ballard, including a bascule bridge over Salmon Bay Waterway, has been authorized, but work is deferred awaiting action of the United States Government.

The construction of the Salmon Bay-Lake Washington Ship Canal required a change in the location and grade of the existing line of railway between these points, a distance of approximately 1.08 miles.

Lake Union Line, Seattle.

A spur 2.36 miles long for serving the industries along West Lake Avenue, and at the southerly end of Lake Union, is under construction. This connects with and makes use of part of the old line between Interbay and Ballard, referred to in the preceding paragraph. An extension of the Lake Union Line, to serve Terry Avenue south of Valley Street, has been authorized but the work is deferred pending completion of change of street grade by the city.

Pilchuck, Grade Revision and Change of Line, Approximately 2 miles.

This work is about 50 per cent completed.

GENERAL.

During the fiscal year business in the territory served by the Northern Pacific Company's lines was quiet; the lumber business, which is an important part of the tonnage handled by your company, was smaller than for several years past. That freight earnings did not show a decrease in spite of the generally dull business in many lines is due to the fact that there were 21,639 more cars of grain delivered at important terminals this year than last.

The fall in passenger earnings was very marked, $1,935,060.47. This heavy decrease was the result of several causes. General conditions were such that people felt poor, and were much more careful about expenditures than during the past three years. The Chicago, Milwaukee & St. Paul Company on May 29, 1911, established double daily passenger train service between Chicago and Puget Sound points via St. Paul. These trains making 1464 trips during the year, naturally took a very considerable proportion of the business that they did from the Northern Pacific, not only the long-haul through business, but much intermediate business handled heretofore exclusively by this Company. The passenger business moving between Portland, Tacoma and Seattle and intermediate points over the line of your company, leased to the Union Pacific and Great Northern, is gradually being divided up more nearly into equal parts between the three companies using the property. The equalizing process results in loss to the Northern Pacific that formerly handled all of the business. There was also greater competition than ever before in the Gray's Harbor and Yakima Valley districts in the State of Washington. There is little doubt also but that the growing use of the automobile has had its effect on the volume of passenger business. The latest figures for registration of automobiles shows that there are, not counting commercial vehicles, 827,284 automobiles in the United States, or about one for every 115 people, and in the States served by your Company, one automobile for about every 90 people. This results in considerable decrease in the short travel on the railroad, and also has had the effect of reducing the volume of pleasure travel, temporarily at least, because people of moderate means cannot own automobiles and also make trips to the mountains, parks and lakes. The same causes that affected passenger earnings caused reductions in express and other sources of revenue classified in the income account under, "Other revenue from transportation" and "Outside operations."

During the year arrangements were completed with the Chicago & Northwestern Railway Company whereby the passenger train known as the "North Coast Limited," formerly operated between St. Paul and Minneapolis and Puget Sound cities and Portland, was run through between Chicago and Pacific Coast terminals. This arrangement will offset in part the competition of the double daily service of the Chicago, Milwaukee & St. Paul Railway and it is thought will increase the movement of business, both freight and passenger, between the territory served by the Northern Pacific and Northwestern Roads. The results of the operation of the train, which was established December 17, have been very satisfactory up to the present time.

The winter was a long and severe one, entailing rather more expense than usual. In spite of that, however, there was a reduction in the cost conducting transportation of $845,090.73, due to the ability of the company to increase its revenue train load from 461.45 tons to 510.54 tons, with a consequent reduction in freight train mileage of 475,172 miles. The passenger train mileage was 24,891 less than for the fiscal year ending June 30, 1911, and 1,219,443 miles less than for the year ending June 30, 1910.

Your attention is called to the taxes paid, which show an increase of $442,281.88. The total taxes amount to 5.9 per cent. of the gross earnings and 14.6 per cent. of the net earnings of the company.

The outlook for general business for the coming year in all of the states served by your company is extremely good. The crops of grains, grasses and fruits have never been better than they are this year, and there is a marked increase in the movement of lumber and manufactured articles.

The report of the Comptroller gives further details of the transactions of the company.

By order of the Board of Directors,

HOWARD ELLIOTT,
President.

PROFIT AND LOSS ACCOUNT.

JUNE 30, 1912.

To	
Discount and commission on treasury securities sold.....	$81,053.15
Settlement of damages in 1909 account of bridge at Aberdeen, Washington	50,000.00
Property abandoned, chargeable to Profit and Loss.....	66,593.37
Adjustment of accounts in connection with construction of Spokane, Portland & Seattle Railway.....	308,990.59
BALANCE	$80,260,438.07
	$80,767,075.18

By	
BALANCE to credit June 30th, 1911, as per annual report.	$78,074,261.88
BALANCE of Income for year ending June 30, 1912, brought down	2,303,814.62
Difference between book value and par value of securities held in treasury, credited to Profit and Loss.....	353,354.05
Unclaimed wages—3 years old.....	17,404.31
Balance of Sundry Accounts.....	18,240.32
	$80,767,075.18

By	
BALANCE to credit of Profit and Loss, as per balance sheet	$80,260,438.07

INCOME ACCOUNT.

FOR THE FISCAL YEAR ENDING JUNE 30, 1912.

Dr. To			*Cr.* By		
OPERATING EXPENSES:			OPERATING REVENUE:		
Maintenance of way and structures	$7,861,490.57		Freight	$43,793,521.58	
Maintenance of Equipment	7,207,716.49		Passenger	15,343,752.05	
Traffic expenses	1,202,292.65		Other	4,286,672.99	
Transportation expenses	20,756,386.75				$63,423,946.62
General expenses	1,130,630.56		OUTSIDE OPERATIONS:		
		$38,158,517.02	Sleeping cars	$317,791.61	
TAXES:			Parlor and observation cars	29,255.10	
State and County	$3,556,587.64		Dining and cafe cars (Deficit)	*112,222.59*	
U. S. Government Corporation Tax	182,491.73		Restaurants	78,337.42	
		$3,739,079.37	Stock yards (Deficit)	*410.60*	
INTEREST AND RENTALS:					$312,750.94
Interest on funded debt	$6,680,810.00		RENTALS RECEIVED		$2,116,171.16
Rentals of leased roads and terminals	517,906.13		HIRE OF EQUIPMENT		615,815.58
Other rentals	8,413.83		MISCELLANEOUS INCOME		29,445.00
		$7,207,129.96	DIVIDENDS AND INTEREST		
DIVIDENDS:			On securities owned and interest on deposits		2,270,411.67
Nos. 56, 57, 58 and 59		$17,360,000.00			
BALANCE carried to Profit and Loss		$2,303,814.62			
		$68,768,540.97			$68,768,540.97

GENERAL BALANCE SHEET, JUNE 30, 1912.

ROAD AND EQUIPMENT (Northern Pacific Estate):			CAPITAL STOCK—Common		$248,000,000.00
Cost to June 30, 1907—			MORTGAGE, BONDED AND SECURED DEBT:		
Road, lands, etc.	$318,333,961.80		Mortgage Bonds (page 30)	$191,365,500.00	
Equipment	37,295,670.07		Collateral Trust Bonds (Northern Pacific-Great Northern joint) total issue	$215,227,000.00	
		$355,629,631.87	Less, Great Northern Railway Company's proportion	107,613,500.00	
Cost since June 30, 1907—				$107,613,500.00	
Road (less Land Department net proceeds)	$46,257,403.11				$298,979,000.00
Equipment	11,983,502.77				
Land Department current assets	4,233,048.73				
		62,473,954.61			
		$418,103,586.48			
Less reserve for accrued depreciation	11,201,799.33				
		$406,901,787.15			
SECURITIES:					
Securities of proprietary, affiliated and controlled companies—pledged, viz.:					
This Company's one-half of $107,613,500 stock of Chicago, Burlington & Quincy Railroad Company to secure $215,227,000 joint bonds made and issued by this Company and the Great Northern Company to pay for said stock, costing	$109,114,809.76				
Securities of proprietary, affiliated and controlled companies—unpledged	46,619,949.46				
		$155,734,759.22			
OTHER INVESTMENTS:					
Advances to proprietary, affiliated and controlled companies for construction, equipment and betterments	$22,665,562.57				
Miscellaneous investments, physical property	1,373,799.98				
		$24,039,362.55			
TOTAL CAPITAL ASSETS		$586,675,908.92	TOTAL CAPITAL LIABILITIES		$546,979,000.00
WORKING ASSETS:			WORKING LIABILITIES:		
Cash	$5,566,568.25		Traffic and car service balances due other companies	$887,486.76	
Securities issued or assumed—held in treasury	17,434,500.00		Audited vouchers and wages unpaid	5,830,039.93	
Marketable securities (other than those issued or assumed)	14,959,510.96		Miscellaneous accounts payable	280,833.26	
Loans and bills receivable	3,706,813.26		Matured interest, dividends and rents	1,159,944.50	
Traffic and car service balances due from other companies	1,148,770.06		Other working liabilities	187,062.78	
Net balance due from agents and conductors	816,827.11				$8,345,367.23
Miscellaneous accounts receivable	4,358,516.86		ACCRUED LIABILITIES NOT DUE:		
Material and supplies	6,411,113.37		Unmatured interest, dividends and rents payable	$4,845,924.34	
		$54,402,619.87	Taxes accrued (partly estimated)	1,955,645.01	
ACCRUED INCOME NOT DUE:					$6,801,569.35
Unmatured interest, dividends and notes.		596,268.50	DEFERRED CREDIT ITEMS:		
DEFERRED DEBIT ITEMS:			Other deferred credit items		191,264.40
Advances and working funds	$65,486.31		APPROPRIATED SURPLUS:		
Special deposits (with Trustees of Mortgages)	633,478.54		Invested in other reserve funds (Insurance Fund)		5,542,517.10
Cash and securities in Sinking and Redemption Funds	203,876.91				
Cash and securities in Insurance Fund	5,542,517.10				
		$6,445,358.86	PROFIT AND LOSS		80,260,438.07
		$648,120,156.15			$648,120,156.15